American Machinist

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Shop Equipment Review

Semi-Annual Résumé of machinery, tools, parts, and materials described in the Materials, Parts, and Equipment Section of the *American Machinist* during the first six months of 1929

Principal Developments

NEW equipment brought out during the 6-months' period just past covers a wide variety of operations, and indicates that improvements have not been confined to any one class of machine. Radical changes in machine tools that were expected by reason of the influence of the new cutting alloys have not materialized, but it is apparent that the designers have these new tools in mind and that they feel that the known requirements are being taken care of in the regular improvements in the machines in rigidity, wider use of antifriction bearings, better lubricating systems, and more attention to the elimination of overhang in toolposts and spindles. Two companies, however, actually specify that their machines are especially designed for the new alloys.

Thirty-two complete grinding machines, six grinding attachments, and three new developments in wheels as compared with 27 new grinding offerings during the previous six months are indicative of the increasing use of grinding in the shop. Eleven of these new grinders are special-purpose machines and show a steady advance in high-production equipment. English and German builders are likewise paying more attention to grinders.

Drilling and boring machines also show advances in design in production equipment, but the standard machine tools are showing improvement in so-called "flexibility," and in sturdier construction at various points. Increased spindle speed capacity, hydraulic feeds, and automatic lubricating systems are among the improvements.

All of the polishing machines described have the motors located in the base, and the spindle is driven by belt or Texrope type of drive, the inference being that the direct connection of the motor to the spindle has not been entirely satisfactory in this field. There is also some indication of this in drilling machines.

Lathes, including the automatic and vertical turret types, are shown to be offered in more rigid designs capable of operating smoothly at higher speeds and feeds. This is being accomplished by better balanced and smoother operating gear trains as well as by the use of heat-treated alloy-steel operating parts, and heavy antifriction bearings that are thoroughly lubricated.

Six new designs in welding machines are offered by American makers, some of the features included being a wider range of welding speeds, and capacity for welding very light material. Some heavy presses are featured, among them a 1,000-ton hydraulic embossing press and a line of straight-side, tie-rod presses. A heavy punch and shear with shearing speeds up to 40 strokes per minute was also described during this period.

Gear milling, generating, and burnishing machines of improved designs were offered. Some new types of machines shown that indicate the wide range of progress include broaches, cutting-off machines, bending machines, dieing machines, hammers, tappers, saws, and screw machines. In heat-treating equipment eight new designs are offered, and in the materials-handling lines progress in the way of new equipment is found in cranes, trucks, and skid platforms.

Although aircraft construction utilizes machines that are similar to those used in automobile building in most cases, the influence of the new industry is becoming evident. A number of machines designed to handle specific operations on aircraft engines are to be found in the new list.

In the European tools described, precision grinding machines are of outstanding interest. Among these is a German screw-thread grinder and a German airplane cylinder grinder. An English planetary grinder is offered for grinding holes in work that cannot be rotated. A line of heavy car-wheel lathes was put on the market by one English firm.

CONTENTS OF THE REVIEW PAGES

American Edition

	No.	Page
Boring and Turning Machines	**1-4**	**77**
Horizontal	1	77
Special-purpose	2-4	77
Drilling Machines	**5-26**	**77**
Upright	5-10	77
Horizontal	11-12	79
High-production	13-16	79
Special-purpose	17-22	80
Portable	23-24	81
Attachments	25-26	81
Gear Cutting and Testing Machines	**27-33**	**81**
Cutters	27	81
Generators	28-29	81
Miscellaneous	30-33	82
Grinding Machines	**34-74**	**82**
Surface	34	82
Cylindrical	35-36	83
Universal	37	83
Special-purpose	38-48	83
Floorstand	49-54	85
Tool	55-57	86
Portable	58-64	86
Attachments	65-70	87
Wheels	71-73	88
Lathes	**74-90**	**88**
Engine	74-78	88
Turret	79	89
Automatic	80-81	89
Special-purpose	82-83	90
Attachments	84-90	90
Milling Machines	**91-104**	**91**
Manufacturing	91-93	91
Knee	94-98	92
Modified-form	99-100	93
Special-purpose	101-102	93
Attachments	103-104	93
Planers	**105-106**	**94**
Presses	**107-112**	**94**
Punch	107	94
Embossing	108	94
Attachments	109-112	94
Punching and Shearing Machines	**113-120**	**95**
Threading Machines	**121-129**	**96**
Tapping and threading	121-124	96
Pipe threading	125-127	97
Attachments	128-129	98
Welding Machines	**130-135**	**98**
Spot	130-132	98
Special-purpose	132-135	98
Other Machines	**136-171**	**99**
Broaching	136-137	99
Bending	138-139	99
Chucking	140-141	100
Cutting-off	142	100
Dieing	143	100
Hammers	144-146	101
Nut setting	147-149	101
Pickling	150-151	101
Sawing	152-155	102
Screw	156-158	102
Screw-driving	159-160	103
Miscellaneous	161-171	103
Polishing Equipment	**172-177**	**105**
Furnaces and Equipment	**178-185**	**106**
Material Handling Equipment	**186-194**	**107**
Cranes	186-187	107
Trucks	188-192	108
Miscellaneous	193-194	108
Woodworking Equipment	**195-203**	**108**
Bandsaw	195	108
Mortiser	196	109
Saw benches	197-199	109
Saws, hand	200-202	109
Attachment	203	110
Balancing, Gaging, and Testing Equipment	**204-220**	**110**
Balancing machines	204-206	110
Measuring equipment	207-208	110
Gaging equipment	209-214	111
Miscellaneous testing machines	215-220	111
Small Tools	**221-238**	**113**
Chucks	221	113
Dieheads	222-223	113
Tapping heads	224-225	113
Toolholders	226-227	113
Wrench Sets	228-229	114
Vises	230-231	114
Miscellaneous	232-238	114
Transmission Equipment	**239-254**	**115**
Speed reducers	239-244	115
Couplings	245-247	115
Miscellaneous	248-254	116
Welding Equipment	**255-269**	**117**
Welders	255-259	117
Welding generators	260-261	117
Miscellaneous	262-269	118
Electrical Equipment	**270-298**	**119**
Motors	270-275	119
Control devices	276-295	119
Miscellaneous	296-298	122
Materials	**299-303**	**122**
Miscellaneous Equipment and Supplies	**304-327**	**123**

Boring Machines

—1—

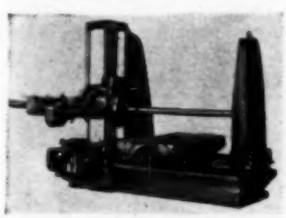
Boring Machine, with Faceplate Drive, Horizontal No. 6 Improved

Defiance Machine Works, Defiance, Ohio. [Vol.70,p.608]

Unit construction of the head, feed, and speed boxes is employed. These units are thoroughly inclosed, and are provided with forced-feed lubrication, ball bearing thrusts on the spindle, and roller bearings on the feed and speed boxes. Independent rapid traverse to the head and platen in all directions at 84 in. per min. is provided, and all feeds, speeds, and hand controls are centralized. The revolutions of the main boring spindle in either direction for tapping operations are controlled by one handle, conveniently located.

Base, columns and tail support are massive in design, the base being provided with outboard supports, giving a maximum width of 54 in. Where milling cutters over 10 in. diam. are employed, backgear drive is recommended. Vertical adjustment of the spindle head is 37 in. and the machine is built with columns of different heights to suit requirements, giving maximum distances from the top of the platen to the center of the spindle of 37, 48, or 60 in. The machine can also be supplied in a range of bed lengths, these being 7, 8, 9, and 10 feet. The maximum distance from the center of the spindle to the top of the platen is 37 inches.

Standard working surface of the platen is 36x75 in., but larger sizes can be supplied. Maximum distance from the center of the spindle to the top of the bed is 48 in. The travel



of the spindle is 60 in., and it is 4½ in. in diameter.

Ten speed changes ranging from 7½ to 157 r.p.m. are supplied when the machine is not equipped with faceplate, backgear drive, while with the backgear the number of speed changes total 20. Twelve feed changes are provided without faceplate drive and 24 with. Weights range from 31,415 to 36,000 lb. Floor space ranges from 19 ft. to 22 ft. in length, by 108 in. in width for all sizes.

—2—

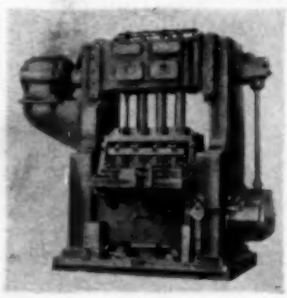
Boring Machine, Cylinder-Sleeve, Four-Spindle, Extra-Heavy Special, No. 8

Defiance Machine Works, Defiance, Ohio. [Vol.70,p.219]

To meet tractor and gas-engine manufacturers' requirements for rough, semi-finished, or finished boring or reaming of cylinder sleeves, four at one time, this special, extra-heavy, No. 8 boring machine has been developed. Production is quoted at from 50 to 100 sleeves per hour for any one operation.

The frame and base castings are of extra broad and heavy design. The center section of the fixture is mounted on a sliding table operated by means of an air cylinder.

The feed mechanism is of unit construction and is easily ac-



cessible. All feed shaft bearings are bronze bushed and use SKF ball thrust bearings. Feed changes are made by removing the cover of the gear case and changing two gears. Hand adjustment for the table feed is provided, but when the machine is in operation, the table feeds automatically up to the boring tools at a rapid rate and when through the cut, it reverses at fast travel.

The drive to all the spindles is transmitted by a belt from the three-step cone pulley, or from a motor connected to a flexible coupling to the drive shaft. Power required varies between 15 to 25 hp., according to the work.

Floor space, 48x118 in., weight 18,000 lb., net.

—3—

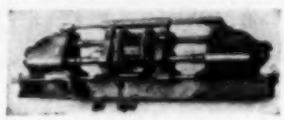
Boring Machine, Horizontal, Two-Way, Special-Purpose

Defiance Machine Works, Defiance, Ohio. [Vol.70,p.372]

Both ends of rear axle housing carriers for farm tractors and similar work can be bored on this two-way horizontal machine. Each head has three spindles spaced in a 29-in. circle and running in Timken tapered roller bearings, and driven by means of a 10-hp. motor, direct-connected. The spindles are driven by means of helical gears.

The fixture revolves about the center, and is mounted on roller bearings. There are four clamping positions, one station for loading and unloading, one station for rough boring, another for semi-boring, and the last for reaming. When loaded, the fixture weighs about 10,000 lb., but can be indexed easily from one position to another by one man.

Height from the sliding ways to the center of the fixture is



28 in. and that from the sliding ways to the lower spindle is 17¾ in. From the top of the sliding ways to the upper spindle is 38¼ in. The head travels 38 in. Size of the fixture base is 35x89 in. All spindle speeds are 32 r.p.m. Oilgear feed is supplied.

An endless belt conveyor is fitted under the fixture to carry away chips. Production of finished pieces is quoted at 30 per hour.

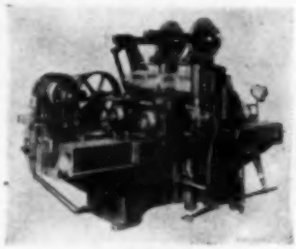
Floor space: Length, 26 ft. 6 in.; width, 86 in. The height is 90 in.; weight 56,530 lb., net.

—4—

Boring, Facing, and Tapping Machine, Radiator-Section, Model R-600

Moline Tool Co., Moline, Ill. [Vol.70,p.1025]

Steam connections of ordinary residence-type radiators may be bored, faced, and tapped on this automatic machine. The



unit is made with four spindles and can be arranged to have all of them boring and facing, or facing and tapping, or half boring and half tapping.

A large bed with V-guides for the two rails carries the spindle units. These rails are gibbed and are actuated by hydraulic cylinders, one for each rail. All fast running shafts and spindles are ball bearing mounted and the spindles are adjustable endwise.

The fixture has an adjustable bar carrying V-block guides and a stop. The adjustment for various sizes of radiator sections are made by a gear and screw. The production obtained on boring and facing is 225 sections per hour. If the tools are dull or the work put in wrong, the pressure on them is built up to that required for reversing, bringing the spindles back to the starting position. The machine can be adapted to facing and tapping, and rough castings are bored, tapped and faced in one operation. Tapping is done by a mechanical feed through a screw and nut. The facing is done hydraulically and the cutters are mounted on the main spindles, while the taps are inserted in small spindles operating through the center of the large spindles. Average production on this machine is 90 sections per hour. The machine can be adjusted to take any section from 5 to 13 in. wide and from 8 to 38 in. between centers of the connections.

Weights, boring and facing machine, 15,000 lb., facing and tapping machine, 18,000 pounds.

Drilling Machines

—5—

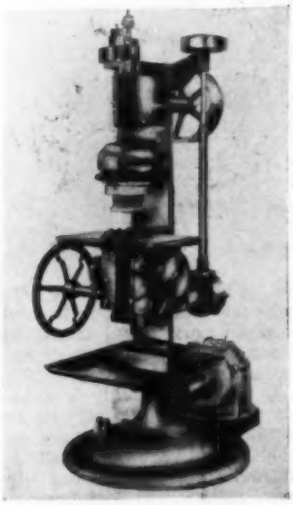
Drilling Machine, Multiple-Spindle, with Power-Feed

Langelier Manufacturing Co., Arlington, Cranston, R. I. [Vol. 70,p.530]

The table has a working surface of 20x12½ in., and the maximum distance from the drill chuck to the table is 14 in. The entire table unit is adjustable on the column up to contact with the drill head. Power feed travel vertically of 7 in. is provided, and the distance from the center of the drillhead to the column is likewise 7 inches.

Drive is obtained from a motor mounted on the rear, but belt drive can be arranged. From the main drive the table feed is actuated by a pinion and gear unit belted to a vertical, telescoping shaft, which, in turn, drives through bevel gears to a drop-worm and wormwheel. The wormwheel shaft carries a pinion meshing with a rack for obtaining the table travel. The table carries an adjustable knockout lever. Hand feed is provided.

The drillhead itself is of standard design and the number and spacing of the spindles can be arranged to suit. The spin-



dle driver consists of a disk in which the spindle crank ends are fitted, and is carried in an eccentric head forged integral with the spindle. The water-cooled head is made of bronze.

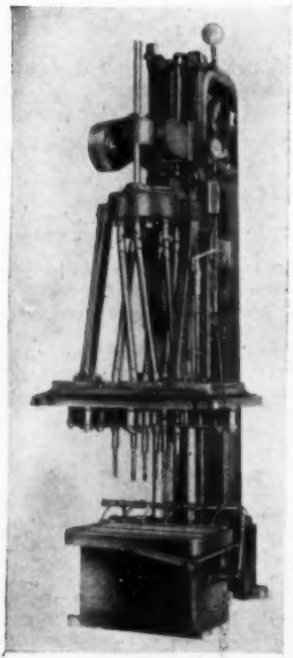
— 6 —

Drilling Machine, Multiple, "Hole-Hog," No. 114-U

Moline Tool Co., Moline, Ill. [Vol.70,p.684]

This universal-joint machine, known as the No. 114-U, has Oilgear feed, Texrope drive, V-guides for sliding columns, a one-shot lubricating system, and a patented vertical spindle adjustment.

The box column is bolted to the reservoir base. Drive is through the spiral gears to the main vertical drive shaft, and thence through spur gears to individual drivers in the circular head, from whence the



power is transmitted to the lower drilling spindles through universal joints. Machine is equipped with driving unit for twelve spindles. The column slide bearing of the double V-type is 12 in. in overall width and 44 in. long.

The feed is adjustable to any depth the drills will stand. The working cycle is automatic and is controlled by a lever. Spindles are vertically adjustable for wear of the drills.

Capacity is twelve $\frac{1}{2}$-in. drills in mild steel. Each spindle is bored No. 3 Morse taper. Minimum center distance adjustment of spindles, $2\frac{1}{4}$ in., minimum distance from spindle nose to table, 4 in., maximum distance, 28 in.; adjustment of spindles within rectangle of 12 x30 in. A 10-hp. 1,200 r.p.m. motor is recommended.

The weight of the machine is 11,500 pounds.

— 7 —

Drilling Machines, Upright, Sliding Head, "Direct Drive," 21- and 24-Inch

Cincinnati Bickford Tool Co., Oakley, Cincinnati, Ohio. [Vol. 70,p.757]

The improvements consist of a sliding head and a box column. The sliding head may be clamped anywhere within a 6-in. vertical movement, whereas for-

merly it was bolted in any one of three positions. Raising blocks may be used between the two column sections and greater distances between the face of the column and the spindle may be obtained through the use of offset blocks.

For single-purpose work, the machine is built to run at one speed only, and the power feed may be left off. A quick-change clutch can be fitted to give two spindle speeds through back gearing. Spindle speeds from 34 to 1,000 r.p.m. may be had through variable-speed motors. The quick-change feed, which is supplied extra, gives five changes from 0.006 to 0.018 in. per rev. A single feed can also be supplied.

The machine shown is provided with a tapping attachment. Adjustable trip dogs may be provided. The spindle is multiple-splined, and when drill-heads are used the lower end of the sleeve is flanged.

Specifications: Drilling to the center of 19- and 22-in. circles by the 21- and 24-in. models, respectively; spindle to table, maximum, 2 ft. $5\frac{1}{2}$ in. and 2 ft. 8 in., minimum, $3\frac{1}{16}$ and $3\frac{1}{2}$ in.; hand spindle travel, $8\frac{1}{16}$ and $11\frac{1}{4}$ in., by power, 8 and $9\frac{1}{2}$ in.; table working surface, 21x16$\frac{1}{2}$ and 24x19 in.; vertical adjustment, 12 in. in both cases; floor space, 2 ft. 3 in. by 3 ft. 6 in. and 2 ft. 6 in. by 3 ft. 11 in.; weights, not including motors, 1,750 and 2,300 lb., net.

— 8 —

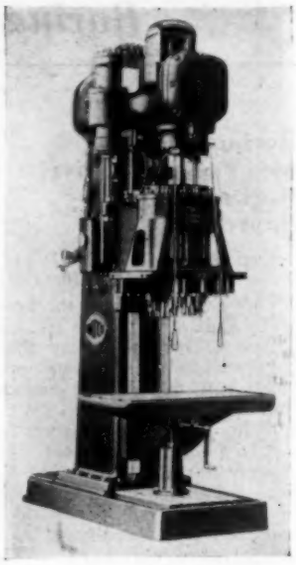
Drilling Machine, Multiple-Spindle, Hydraulic, Adjustable, Natco, Model D 13 H

National Automatic Tool Company, Richmond, Ind. [Vol. 70,p.990]

This machine covers a large variety of work and is flexible in its application. Three types of heads have been designed. They are 12x18 and 16x24 in. rectangular, arranged for either 22 or 24 spindles, and 18 in. round, arranged for 12 spindles. Both are of the standard Natco design, having patented independent change of speed to each spindle, or a single speed if desired. Either type has a neutral position for the spindles not in use.

Two heavy T-slots are machined in the flange of the head for attaching the spindle and arm equipment. The table is of the adjustable knee type. The minimum height of the working surface is 22 in. with $17\frac{1}{4}$ in. of adjustment. The table is raised or lowered by means of a removable crank. The working surface of the table is 23x40 in. and two T-slots run lengthwise.

The hydraulic feed is the outstanding feature. Two 5-in. low pressure oil cylinders are mounted in the heavy brackets at the top of the column. The maximum combined pressure of these cylinders is 8,000 lb. and is applied directly to the head flange. Two handles control the machine completely. Rapid travel down, feeding, rapid travel up, and stopping are controlled automatically by adjustable trip dogs. If an emergency stop is necessary at any time, pulling the other handle brings the head to a stop and automatically returns it to the starting position. A constant-speed oil pump is used, equipped



with a by pass so that the pressure cannot be built up beyond the correct amount for feeding.

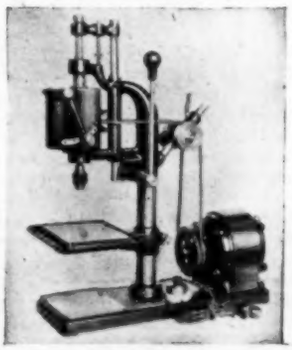
The total vertical adjustment of the drill spindle is 2 in. A cascade lubricating system feeding from the drip of the pump is used to insure positive oiling. Direct motor drive is provided. Specifications are: Center of head to face of column, $15\frac{1}{2}$ in.; top of base to bottom of head flange, maximum, $62\frac{1}{4}$ in., minimum, $43\frac{1}{4}$ in.; top of base to top of table, maximum, $39\frac{1}{4}$ in.; minimum, 22 in.; head travel, 19 in.; height of machine, head up, 139 in.; range of power feed, 0 to 15 in. per min.; rapid traverse, 90 in. per min.; floor space required, 34x85 in., and weight 11,000 pounds.

— 9 —

Drilling Machine, Bench-Type, "Super Drill"

Thompson Manufacturing Co., 60 India St., Boston, Mass. [Vol.70,p.993]

Through patented spindle construction, five spindle speeds are available without stopping. The spindle speeds are 1,600, 2,200, 3,000, 3,800 and 4,250 r.p.m. Changing the speed is effected by shifting a speed lever from one notch to another. This action causes the



"Wonder Pulley Chamber" to open or close axially. Since the fingers on the two cones mesh at different radii according to the setting of the lever, the spindle speeds are varied in accordance to how much the fingers are moved in or out. A round belt drives these conical pulleys and power is transmitted from a ¼-hp. motor. An adjustable spring locking device regulates the tension of the belt. Ball bearings are provided at all points. The spindle has a travel of 2 in., and is provided with a standard Jacobs or Ettco chuck of ½-in. capacity.

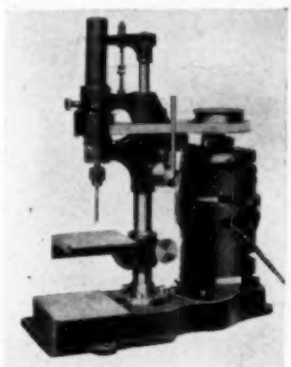
Dimensions: Base to chuck, 9 in.; table to chuck, 6 in.; chuck to main column, 5½ in.; overall, 26x22½x12 inches.

— 10 —

Drilling Machine, Bench-Type, Sensitive Model R-53

High Speed Hammer Co., Rochester, N. Y. [Vol.70,p.1032]

This machine has been designed to take care of work from the smallest diameter hole up to ¼ in. On the standard machine the spindle speeds are 2,700 and 5,500 r.p.m. In the type known as the "Tool Room Special," 3-step pulleys provide speeds of 1,500, 3,000 and 6,000 r.p.m. The spindle is guided by vertical quills supported by



annular ball bearings which take the belt pull. Two ball thrust bearings carry the top of the spindle at the feed arm. Spindle travel can be set by the depth gage. Maximum travel is 2½ inches.

The table can also be adjusted in height or entirely removed. The base has a ground working surface 4x6 in. and will take work up to 7½ in. in height. It also has an oil groove and self-cleaning column support. Specifications for the machine include: Drilling to center of 6 in. circle; base overall 10x20 in.; height overall 24½ in.; net weight 108 lb. Standard equipment includes a 110- or 220-volt single-phase, 25-, 50-, or 60-cycle a.c. motor, or 110- or 220-volt d.c. motor, 0 to ½-in. chuck, and cord.

— 11 —

Drilling Machine, Horizontal, Duplex No. 0

Frew Machine Co., 124 W. Venango St., Philadelphia, Pa. [Vol.70,p.186]

Drilling, counterboring, turning, hollow milling, and facing can be done on this No. 0 duplex horizontal drill. The machine is designed for performing these operations from opposite directions on the same axis, the work being held in a suitable fixture mounted on the bed. Several types of fixtures

can be used, and they may be operated by either an air clamp or spring-type treadle.

The head spindles in the standard machine are carried in Timken roller bearings, but can be provided with ball bearings. Stops are provided for regulation of the depth to which the tools are permitted to cut.

The usual method for providing motion to the heads is by the use of a hand screw feed. Another method for feeding the heads is by means of individual lever feeds. The screw feed type can also be furnished with power feed if desired. The machine can also be furnished with individual built-in motor drive for each head, geared to the spindle.

The largest hole that can be drilled in cast iron is ⅞ in., and the swing over the bed is 9 in. The maximum and minimum distances between the spindle ends are 23½ and 2 in., respectively. The length of feed for each head is 10¾ inches.

Floor space, 48x24 in.; weight 300 pounds.

— 12 —

Drilling Machine, Automatic, Horizontal

Bradford Machine & Tool Co., 657 Evans St., Cincinnati, Ohio. [Vol.70,p.840]

This general-purpose automatic drilling machine consists of one of the company's standard single automatic units mounted horizontally. The spindle is arranged so that various types of auxiliary multiple-spindle drilling attachments may be mounted. The set-up shown is used by an automobile manufacturer for reaming four ⅝-in. holes, 1⅞ in. long, in a valve lifter guide bracket. Stock ¾

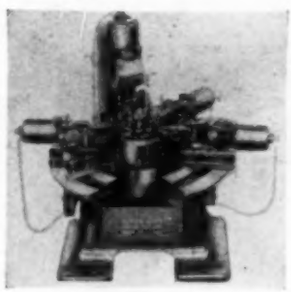
in. in thickness is removed and the floor-to-floor time on this operation is 36 sec. One man operates two machines.

— 13 —

Drilling and Tapping Machine, With Automatic Indexing Fixture, Multiple-Spindle, No. 119

Kingsbury Machine Co., Keene, N. H. [Vol.70,p.183]

To suit the customer's requirements, the standard drilling tapping heads made by the above company can be grouped about the No. 119 automatic indexing fixture to form automatic drilling and tapping machines capable of performing such operations as drilling, tapping, counterboring, facing, and milling. Pieces can be handled that have one hole or several at various angles to each other.



The drilling heads can be mounted in horizontal or vertical positions, or at any angle in between. The heads have capacity for ⅝-in. drills, and have built-in motors and automatic feed. The heads and indexing mechanism are synchronized by means of air trips. The machine can be arranged for full automatic operation or a control valve, which the operator trips for each cycle, can be fitted. The machine is capable of 1,800 cycles per hour.

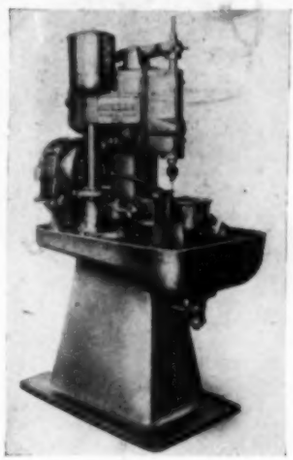
The circular tables on which these heads rest are furnished in two sizes, 52 and 72 in. in diam., indexed by a Geneva stop.

— 14 —

Drilling Machine, Dial-Feed, ⅜-Inch

Kent Machine Co., 286 N. Water St., Cuyahoga Falls, Ohio. [Vol.70,p.451]

This unit for rapidly drilling, burring, or countersinking parts is fed by means of a dial plate and clamps the work during the machining operation. It is entirely automatic. The dial feeding interval is short, and idle time is reduced to a minimum. The dial does not restrict the centralizing of the part, but merely serves to convey it under the spindle. A bracket is provided to carry a guide bushing.



The camshaft speed controlling the timing operations can be so regulated that full capacity of the machine is obtained. Practically any predetermined speed and feed of drilling can be secured in design. The capacity of the machine is up to ⅝-in. holes, ¾ in. deep. It can be furnished with a cone-drive belt or a constant-speed motor, and is supplied on a pedestal, or arranged for bench use.

Weight, floor type, 1,350 lb. Floor space, 24x44 in. Power required, 2 horsepower.

— 15 —

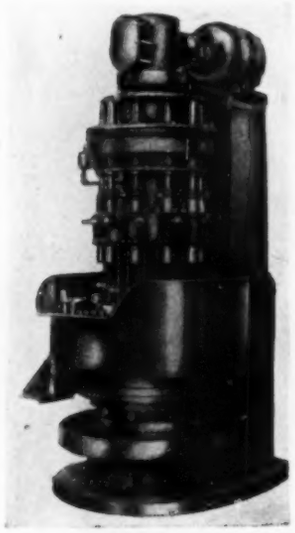
Drilling Machine, Continuous, Multiple-Spindle

Langelier Manufacturing Co., Providence, R. I. [Vol.70,p.609]

Several important improvements in construction, operation, and adaptability have been incorporated in this multiple-spindle, continuous drilling machine. The principle and general design were previously described on page 825, Vol. 61, of the *American Machinist*, and these have been retained, but in the unit illustrated the drilling spindles, driving mechanism, and the tap housing have been reconstructed so that different drilling speeds can be obtained by means of interchangeable pick-off gears.

The drilling spindle units have been made separate so that the machine can be readily arranged for 6, 8, or 10 working stations, governed by the cycling of work. The unit can be adapted for multiple-spindle drilling heads.

The work-table feed slides



have been changed from round to rectangular form to keep them rigidly in position. The working tables are positively fed up and down by rollers. Drill spindles have vertical adjustments and have drill-guide, work-clamping jaws. A throw-out clutch has also been put into the feed driving mechanism. Another improvement is a new form of chip guard.

About the post frame revolves a circular carrier to which is attached the drilling units with the work tables and the unit driving mechanism. The carrier revolves upon a large thrust ball bearing and another ball thrust bearing at the top takes the cutting thrust of the drills. The carrier is driven by a large ring bevel gear through a reducing train of gears belted to a 2-hp. motor. The machine is entirely surounded by guards.

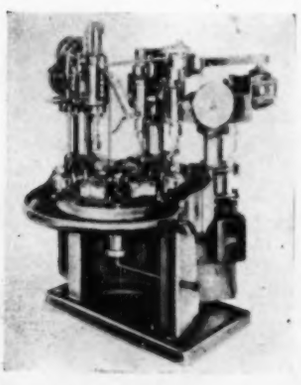
Floor space, 70x74 in., height, 9 ft. 6 in., weight 13,000 pounds.

— 16 —

Drilling and Tapping Machine, Automatic, Multiple-Unit

Charles Stecher Co., 2452 Greenwood Ave., Chicago, Ill. [Vol.70,p.915]

Production of 10,000 pieces per day is quoted for this automatic drilling and tapping machine, which is an all-electric, full-automatic type. According to the manufacturer, the unit can be adapted to drilling and tapping almost any kind of small parts. A reversing motor is used for the tapping head and this action takes place 50 times per minute. Because of the large amount of heat generated by this continuous reversing, compressed air at 5 lb. per sq.in. is blown through the end shields of the motors.



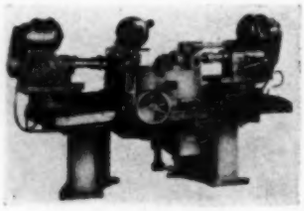
The drilling heads use standard 3-phase, normal-torque, normal-reactance, squirrel-cage, induction motors rated at 1½ hp., at 1,800 r.p.m., and equipped with ball-bearings. The finished work drops into a tray automatically.

— 17 —

Drilling and Tapping Machine for Radial Engine Crank Cases

Bradford Machine Tool Co., 657 Evans St., Cincinnati, Ohio. [Vol.70,p.378]

Rough and finish boring and tapping of 5-, 7-, and 9-cylinder crank cases for radial airplane engines can be done on this three-way drilling and tapping machine. The fixture is provided with a triple index control, and each unit is mounted on a swivel-type block in order to permit the necessary adjustment. Each unit is also controlled independently by means of hand valves on the front of the machine.



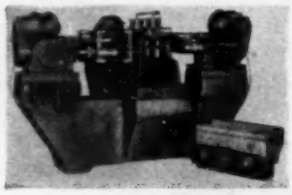
Rough boring is done at the right, finish boring at the back, and tapping at the left. The engine is indexed until all the operations have been performed on the exhaust ports. A duplex system is provided for the distribution of cutting lubricant, using kerosene on the boring tools and lard oil on the taps. Floor-to-floor time for 5-, 7-, and 9-cylinder crank cases is 4, 5, and 6 min., respectively.

— 18 —

Reaming Machine, Cylinder-Block, Three-Way

Bradford Machine Tool Co., 657 Evans St., Cincinnati, Ohio. [Vol.70,p.680]

Reaming of the water jacket holes in cylinder blocks at the rate of one block every 30 sec. is possible. Machining time required is 16 sec., and handling time is 14 sec. The machine is designed to be used in connection with a conveyor attached to the front of the machine on a level with the bottom of the fixture. The cylinder block slides on to the hardened slide strip on the bottom of the fixture, which holds the work in position by means of dowel pins. The dowel pins are lifted into position or withdrawn by the hand lever. Two air-actuated rams clamp the work.



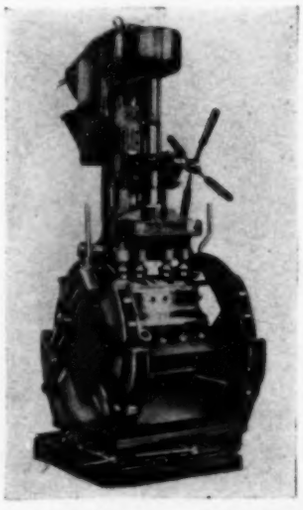
The feeding mechanism on the heads is tripped simultaneously by the control valve on the side of the fixture. Water-jacket holes are reamed to 0.943 in. in diam. in cast iron and the stock removed is $\frac{3}{32}$ in. on the diameter. A spindle speed of 350 r.p.m. is used.

— 19 —

Chamfering Machine, Cylinder-Block, Upright, Direct-Drive

Cincinnati Tool Co., Oakley, Cincinnati, Ohio. [Vol.70,p.759]

Adaptability of the line of "Direct Drive" upright drills built by this company is illustrated by their use for chamfering the cylinder bores of an eight-cylinder engine block. With the clamp turned back, the block is rolled from a conveyor into the cradle fixture from the right, and is located by the stud, the parallel guides above, and the clamp. The cradle fixture is then turned 45 deg. and four of the cylinder bores chamfered simultaneously. After chambering the first four cylinders, the fixture is swung forward through 90 deg. and shifted laterally by means of a lever. The other four cylinder bores are then chamfered, and finally the fixture is turned back to the position for unloading. The bottoms of the bores are chamfered in the same way in a similar unit.

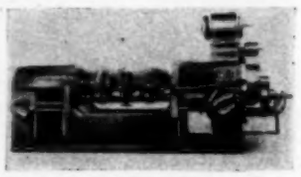


— 20 —

Drilling Machine, Multiple-Spindle, Horizontal

Davis & Thompson Co., 57th Ave. & Mitchell St., Milwaukee, Wis. [Vol.70,p.917]

Adapted to drilling push rod guides for automobile motors, this drilling machine drills from one side and reams from the opposite. The heads are fed by a cam located in the housing. The drill spindles are located very close together and are driven by means of cranks. The second spindle from the top has a gear mounted on a crank driving the spindle and there is also another gear for the second spindle from the bottom. The six spindles are driven by six cranks from this gearing through a connecting rod which connects all the cranks together. Thrusts on the spindles are taken by means of rings or collars turned on them.

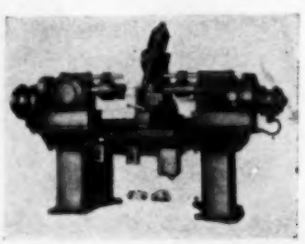


— 21 —

Drilling Machine, Horizontal, Automatic, Special

Bradford Machine Tool Co., Cincinnati, Ohio. [Vol.70,p. 1031]

Three heads are applied to this horizontal drilling machine, two heads horizontally, and another at the rear and inclined. It is intended for the production of hydraulic shock absorber parts. The machine is arranged so that the left-hand head drills two $\frac{33}{64}$-in. holes $\frac{1}{2}$ in. deep, and one 0.557-in. hole $1\frac{1}{8}$ in. deep.



The right-hand head drills three 0.257-in. holes $\frac{7}{8}$ in. deep, while the head mounted on the angular bracket drills a 0.332-in. hole, $\frac{1}{4}$ in. deep. The material is cast iron and the floor-to-floor time is 36 sec. per piece.

The cam on the head controls

the action of the tripping rods at the back of the fixture, and thus makes it possible to trip all heads simultaneously by a single motion. The action of all units is fully automatic and they require no attention. The circular T-slots in the table facilitates the re-arrangement of the drilling units.

— 22 —

Drilling Units, Automatic, Improved

Langlier Manufacturing Co., Arlington, Cranston, R. I. [Vol. 70,p.565]

One of the chief improvements is positive cam travel, accomplished by the substitution of a face cam instead of the radial cam used in the earlier models described on page 1111, Vol. 66, of the *American Machinist*. Other features are: Total inclosure of moving parts; simpler construction, and the use of ball or roller bearings wherever possible. Since

these units are self-contained as to feed and speed, they can be arranged around an indexing dial to produce successive operations on a piece.

The units can be used in gangs, horizontally or vertically, side by side, or in a horizontal duplex machine. They can also be used at any angle. Three sizes are made, the Nos. 11, 21, and 31, to drill, respectively, ¼, ½, and ¾ in. in steel at maximum spindle speeds of 8,000, 6,000, and 4,000 r.p.m., respectively. The cam provides a total travel of 3 in. in all cases. Change gears having ratios from 1 to 1 and 4 to 1 are used to vary the number of cam cycles. The cams are specially cut for each job to give rapid approach, drilling feed, and rapid return. The reversible tapping attachment can also be used with special feed cams. Where motor drive is not desirable, belt drive can be used. For the Nos. 11, 21 and 31, horsepower requirements are 1, 1½ and 2, respectively.

Weights, 250, 325, and 400 lb., respectively.

— 23 —

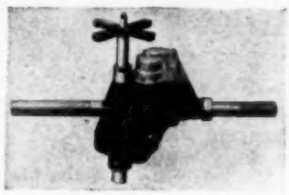
Drill, Pneumatic, No. E-5

Rotor Air Tool Co., 5905 Carnegie Ave., Cleveland, Ohio [Vol.70,p.567]

This drill weighs 22 lb. and is compact and well-balanced. It is suitable for heavy-duty, $\frac{25}{32}$- and 1¼-in. drilling, $\frac{11}{16}$- and $\frac{13}{16}$-in. reaming, setting ¾-in. S.A.E. nuts, and, in the reversible type, tapping of ⅜-in., ½- and ⅝-in. holes. By removing the dead-end handle, the drill may be used for many types of close-quarter work. It may be supplied with a feed screw as shown or with a spade handle.

The air motor has only three moving parts, which transmit power through heat-treated gears, three speeds being provided, which are 220, 280, and 350 r.p.m. The governor automatically prevents racing and at idling speeds reduces air consumption to a minimum.

Positive lubrication is provided by means of an oil reser-



voir in the body. The feed screw is of the heavy-duty type with 3½ in. of travel. Special attachments for nut setting and stud driving can be furnished. Additional speeds ranging from 220 to 600 r.p.m. can be furnished on special order.

— 24 —

Drills, Electric

Schauer Machine Co., Successor to the Neal & Smith Electric Tool Co., 905 Broadway, Cincinnati, Ohio. [Vol. 70,p.918]

The Bulletin C ¼-in. drill employs an air-cooled motor operating in ball bearings. The machine is of the offset, close-quarter type having all gears, pinions, and studs of heat-treated steel. The handle and

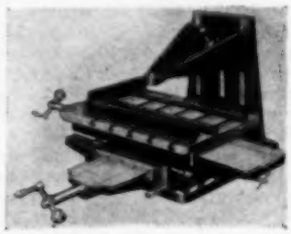
cover cap are removable without disturbing the bearings, switch or electrical connections, thus permitting inspection while the motor is in use. The chuck employed is furnished with ball thrust bearings. The approximate speed at load is 1,400 r.p.m. Length, 11 in.; weight, 6 pounds.

— 25 —

Layout Table, Improved, 14x20-Inch, "Master Toolmaker"

C. C. Craley Manufacturing Co., Box 192, Shillington, Pa. [Vol.70,p.189]

This improved size is approximately twice as large as the previous model, the work table having an area of 14x20 in., with longitudinal movement of



18 in., transverse movement of 12 in., and vertical movement to suit the purchaser. The "Master Toolmaker" may be used on a drill press much like an ordinary jig. The work is clamped against removable guide strips at right angles. Tapped holes are provided in the parallel bars for use in clamping work. The guide strips form the base line points from which all locations are determined by micrometers.

This construction makes it possible to machine any number of holes without laying them out. If the location of the hole is more than 1 in. from the guide strips, the desired standards or distance bar is placed in the V-bearing between the stop and micrometers.

The back or upright member is removable from the base when using the tool on the milling machine. The arm or bushing support is fitted with hardened and lapped bushings to receive the slip bushings for different size holes.

Weight, 400 lb., net.

— 26 —

Vise, Drill Press, "Ammco"

Automotive Maintenance Machinery Co., 316 W. Washington Blvd., Chicago, Ill. [Vol. 70,p.489]

A feature of the vise is the V-shaped slot in the movable jaw, which affords positive clamping of round pieces in a vertical position. The swivel

handle of the tool makes the vise easy to use, and it can be swung outward or back out of the way when necessary. The jaws are 3½ in. wide, 1½ in. deep, and they open 4½ in. They are machined all over.

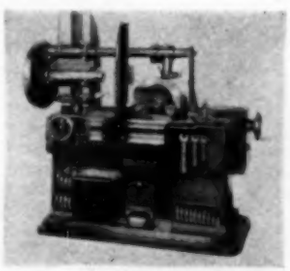
Gear Cutting and Testing Machines

— 27 —

Gear Cutting Machine, Automatic No. 3, Improved

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.224]

Increased range and a positive drive eliminating any tendency for backlash are among the improvements incorporated in this machine. The capacity has been increased to cut gears up to 4 D.P. in cast iron and 5 D.P. in steel, and to handle work up to 36 in. in diam. by 11-in. face. Economical cutting of small gears and other parts with narrow faces is facilitated



by giving a shorter minimum stroke of ½ in. to the cutter slide. The machine is suitable for operations where automatic indexing is a desirable feature.

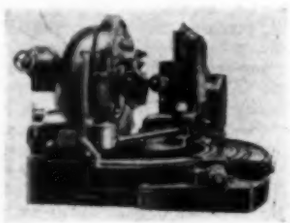
Power is transmitted from the motor in the base by means of a silent chain and sprocket. The unit, however, can be belt driven. The work spindle and slide are held positively against the upright ways of four points. The cutter spindle is driven by means of a bronze driving gear from a worm sliding on a multiple-splined, horizontal driving shaft, thus assuring a positive drive and eliminating backlash. The oiling system has been simplified and improved.

— 28 —

Gear Generator, 60-Inch, "Hypoid"

Gleason Works, Rochester, N. Y. [Vol.70,p.529]

This equipment for cutting large "Hypoid" gears consists of a large gear generating machine designed for cutting spiral bevel gears with the addition of a special workhead for cutting Hypoid pinions. In addition to the usual adjustments of the spiral bevel gear head, the Hypoid head has two others: First, the work spindle can be offset vertically above or below



center, so that the pinion can be cut in the same relative position in the machine as the position in which it is to run with the meshing gear; second, a small transverse adjustment of the head is supplied.

The Hypoid head can be used for cutting Hypoid pinions and spiral bevel pinions and gears of small pitch diameter. The approximate maximum dimensions of gears that can be cut with this equipment are 60-in. pitch diam., 30-in. cone distance; 8-in. face widths; 1½ D.P., from 0 to 25 deg. spiral angle with ratios between 1 to 1 and 1 to 10, and 10 in. vertical offset.

— 29 —

Generator, Gear, 10-Foot, Sykes

Farrell-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y. [Vol.70,p.683]

This Sykes gear generating machine is capable of handling helical, spiral, and herringbone gears of larger pitch diameter than hitherto has been possible. Gears up to 19 ft. in diam., with a 54-in. face width can be cut.

Continuous herringbone teeth up to 0.75 D.P. and straight-toothed gears up to 6-in. C.P. can also be cut. Gears can be cut integral with their shafts to shaft diameters of 22 in. The machine is 25 ft. long, 20 ft. wide, and 12 ft. high above the floor line. The indexing worm wheel is 12 ft. in diam., and the cutter index wheel is 3 ft. in diameter.

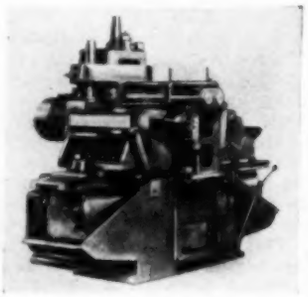
— 30 —

Gear, Milling Machine, Special

Kearney & Trecker Corporation, Milwaukee, Wis. [Vol.70, p.989]

This machine has been developed for rough milling the teeth in differential gears and pinions and has capacity for 18 gears and 40 pinions per hour. Three 4 to 5 D.P., high-carbon, 28-tooth gears, and four 14-tooth pinions are milled simultaneously, the cutting time for a gear tooth being 17 sec., and that for a pinion tooth, 16 sec. The machine is not universal, but can be adapted for gears or pinions with a different number of teeth, or different pitch diameter by the addition of other fixtures. The entire operation is automatic, with the exception of loading the indexing spindles.

The machine is a No. 1404 Mil-Waukee-Mill "Simplex," equipped with a two-spindle horizontal head, and two opposed, independently-controlled, cam-operated tables. Each table carries an automatic indexing fixture, one having three spindles for the gears, and the other four spindles for the pinions. There are two cutter arbors, one on the gear side carrying three 4 to 5 D.P. high-speed-steel, bevel gear roughing cutters, and that on the pinion side, four similar cutters. The outer support bearings are made so that they can be slipped off the arbor without disturbing either the overarms or the front arm brace. Both the center bearing and the end bearing supports are mounted in guides, so that they can be moved vertically to correct the adjustment of the cutters with respect to the work.



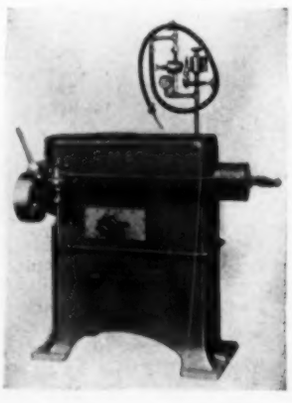
The tables are controlled independently by drum cams so that one side may be stopped at the outstroke for changing work or cutters without stopping the other. The arbors, work tables, and indexing mechanism are driven by a single motor through a series of horizontal and vertical gear reduction units. The work is completely inclosed while in the cut.

— 31 —

Gear Burnishing Machine, "Bolender"

City Machine & Tool Works, 1517 E. Third St., Dayton, Ohio. [Vol.70,p.723]

Uniformity of pressure applied to the gears while being burnished is one of the principal features of this machine. Other advantages are: Increased product accuracy, decreased set-up time, increased speed, and a minimum of floor space required. The unit has one work spindle and two burnishing spindles. The movement of the member carrying the two burnishing gears and the spindles is controlled by an air cylinder.



The gears are burnished with the center line in a vertical position, thus insuring straight bearing on gears of any weight or length. Gears of various lengths or diameters are accommodated by moving the supporting member up or down or sidewise by means of hand knobs.

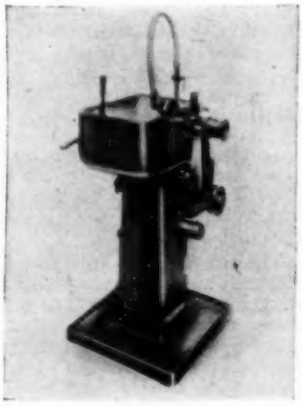
Production in a 9-hour day is quoted at 2,300 to 3,000 gears of 6 to 8 pitch, varying from 16 to 30 teeth.

— 32 —

Gear Cutter Sharpening Machine, No. 0

Newark Gear Cutting Machine Co., 69 Prospect St., Newark, N. J. [Vol.70,p.910]

Intended for sharpening formed tooth cutters and gashing cutters, this improved machine will take cutters from the smallest diameters up to 10 in. The principle employed is practically the same as that used in an older design, one of the outstanding improvements being a fully Timkenized wheel spindle. It is belt driven at 2,800 r.p.m. The cutter is held on a stud.



The machine may be set quickly to grind a radial tooth or undercut tooth of any required hook-angle. The cutter is indexed from tooth to tooth by the operator, who locates it by means of a spring-pawl. The indexing finger is equipped with a screw feed adjustment. The machine is equipped with a diamond and truing device for dressing the wheel.

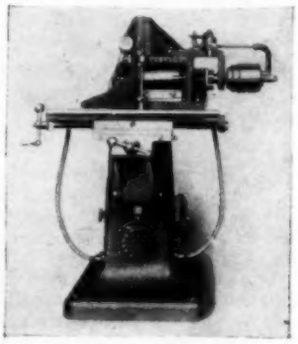
Floor space is 24x30 in.; weight 925 lb. net.

— 33 —

Chamfering Machine, Tooth, Pneumatic

City Machine & Tool Works, 1517 E. Third St., Dayton, Ohio. [Vol.70,p.991]

With the addition of a "Logan" air cylinder to the "Bolender" tooth chamfering machine, the production of the unit can be increased by 20 or 30 per cent, according to the maker. The machine was previously described on page 713, Vol. 69, of the *American Machinist*. The production quoted was 45 chamfered teeth per min., depending upon the pitch and form required.



The standard machine will accept gears up to 10 in. in diam., but the capacity can be increased by slight alterations in design. The spindle operates at 1,600 r.p.m. The dimensions are: Height, 49½ in.; length, 36 in.; and width, 25 inches.

Grinding Machines

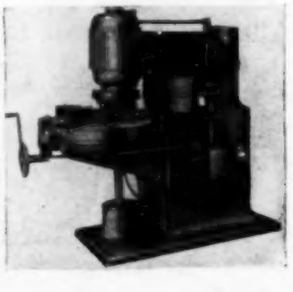
— 34 —

Grinding Machines, Surface, Production, Nos. 700 and 800

Covel-Hanchett Co., Big Rapids, Mich. [Vol.70,p.645]

Hardened steel dies, gages, and tools, and other parts may be ground accurately and rapidly on these vertical production surface grinders. The chief differences between these models are that the No. 700 is lighter than the No. 800, illustrated, and that the smaller model is equipped with hand feeds ordinarily.

The pivoting end of the arm on each is bored for roller bear-



ings, and is carried on a vertical post at the rear. Drop-forged steel spindles and armature shafts are used on both models, deep-groove ball bearings being fitted.

The No. 700 will grind work either 6x10 in., or 4x16 in., whereas the No. 800 will take care of work 7x12 in. or 5x20 in. on the rectangular table or grind on a 27-in. circular table. Segmental or cup wheels 10, 12 and 14 in. in diam. can be employed by the No. 800 and 5-, 9½- and 10-in. ring or cup wheels can be used on the No. 700. Spindle speeds for the larger machine are 1,250 and 1,800 r.p.m., and those for the lighter model are 1,800 and 3,600 r.p.m. The table on the No. 800 has vertical power feed, and the rate of travel of the wheel over the work is 15 to 35 ft. per min. Vertical adjustment can be furnished.

Floor space for the Nos. 700 and 800, respectively, 22x28 in. and 24x50 in. Weight 1,150 and 2,950 lb., respectively.

— 35 —

Grinding Machine, Cylindrical, Plain, No. 35

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.221]

Larger size is the feature of the No. 35 machine, which is similar in every way to the Nos. 30, 32 and 33, except in size. These models were previously described on page 851, Vol. 68, of the *American Machinist*. As in the smaller sizes, the tailstock and headstock centers swing

work 12 in. in diam. with a 24-in. wheel, and 6 in. in diam. with a 30-in. wheel, but the centers of this model will take work 72 in. in length.

Among the features common to the line are: An especially wide range of table and work speeds; very high table speed; conveniently grouped controls; changes of speed in the totally independent work drive; table movement made through sliding gears and individual levers, complete lubrication of the wheel spindle and all mechanisms by gravity flow of filtered oil, and a choice of overhead countershaft drive by a single pulley or drive from a motor mounted within the cabinet base. Oil returned to gravity pan through a reservoir kept flooded by a geared pump.

Power required varies from 15 to 40, depending upon the work. Floor space, 74x189 inches.

— 36 —

Grinding Machine, Cylindrical, Heavy-Duty 24 x 36-Inch x 28-Foot

Cincinnati Grinders, Inc., Cincinnati, Ohio. [Vol.70,p.371]

Chief among the features is the duplex work table. The machine is made up of two units of unequal lengths with a total of 28 ft. between centers. When used on a production basis or for shorter lengths, the tables

may be uncoupled, the headstock or footstock transferred to the unit to be used, and the idle part left at one end of the 61-ft. bed. The table receives its motion through a rack and pinion driven by a worm and gear, the shock of reversal being absorbed by a clutch. The swivel tables accommodate taper work up to 14 ft. in length without setting over the head or tailstock. They are of the angular type and have bearings on the sliding table and are clamped to it at either end.

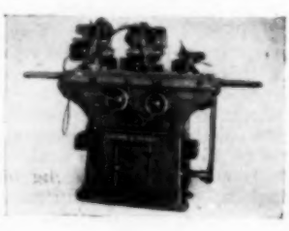
The 36x4-in. wheel is driven by a 30-hp. motor through a jackshaft and a Texrope drive. The wheel spindle is mounted upon several pre-loaded ball-bearings. The power for the rapid traverse of the wheelhead is supplied by a ½-hp. a.c. motor. The headstock is driven by a 3-hp., d.c. variable-speed motor through a Texrope drive to a worm and wormwheel. Back-gears provide additional speed variation. Where d.c. current is not available, it is supplied by a generator mounted on the rear.

— 37 —

Grinding Machine, Universal, Motor-Driven, No. 1

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.413]

The No. 1 motor-driven machine is similar in design to the belt-driven No. 1 machine, except that, like the Nos. 2, 3 and 4 motor-driven machines, it is equipped with three constant-speed, balanced, electric motors. An important features is the reversible wheelstand motor, which



is reversed when the machine is used for internal grinding. Hence, it is not necessary to swivel the wheelstand platen to the reverse position.

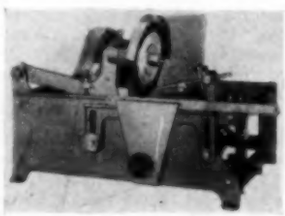
The base is cast in one piece, and is supported at three points. The bed is made long in order to support the table at its extreme travel. The cross-feed slide is counter-weighted to eliminate backlash and the pull may be reversed for internal grinding. All motors are mounted integrally on the headstock, on the wheelstand and at the rear of the machine, respectively, and are carefully balanced.

— 38 —

Grinder, Saw, Metal-Grinding, Automatic, Model G-109

Foley Saw Tool Co., Inc., 9 Main St., N. E., Minneapolis, Minn. [Vol.70,p.186]

For automatically sharpening hacksaw and circular saw blades, as well as circular saws up to 8 in. in diam., this machine has been developed. The adjustment



permits automatic spacing for teeth from 14 per in. to ¼ in. spacing. The automatic spacing gives all teeth the same cutting angle and insures equal work from each tooth. The average blade can be ground four to five times, if not allowed to become too dull before sharpening.

— 39 —

Grinder for Automatic Diehead Chasers

Jones & Lamson Machine Co., Springfield, Vt. [Vol.70, p.219]

Simplicity, accuracy, and complete protection of all working parts from emery are the features of this machine, which is intended for grinding the chasers used on the J & L automatic diehead. It is driven by a ¾-hp. motor mounted on a pedestal, the motor being of ball-bearing construction and running on 110-volt, 60-cycle circuit.

In order to provide for the two distinct grinding operations, the two sides of the grinder are designed to take independent set-ups. Micrometer adjustments reading in thousandths are arranged for. Parts of the regular J & L chaser sharpening fixture are employed to provide proper holding of the chasers, and angular adjustment for

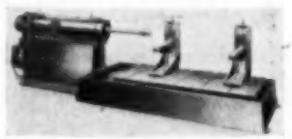
chamfering on the swinging slide and angular adjustment for top rake angles on the horizontal slide. The pinion and handle for operating the horizontal slide are adjusted for position by merely withdrawing the pinion from the rack pieces and adjusting the handle to suit the slide travel.

— 40 —

Grinding Machine, Cylinder, Heavy-Duty, Horizontal, Model MJ

Hutto Engineering Co., Inc., 515 Lycaste Ave., Detroit, Mich. [Vol.70,p.226]

Cylinders ranging from 3 to 12 in. in diam., and up to 55 in. in length can be ground straight and round within the commercial limits on the inner surfaces, and with any desired finish by



means of a Hutto grinder in combination with the Model MJ, horizontal, heavy-duty grinding machine. Spindle speeds may be set at 100, 150, or 200 r.p.m. and the reciprocating speed may be 50, 75, or 100 cycles per min. at a travel of 4 in. The machine is equipped with a 7½-hp. motor, and a ¾-hp. motor is used to drive the kerosene circulating pump. The table is used as a kerosene reservoir and has a capacity of 35 gallons.

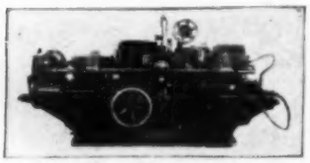
— 41 —

Grinder, Crankpin, 16-Inch, Type AB

Landis Tool Co., Waynesboro, Pa. [Vol.70,p.373]

The front portion of the type AB crankpin grinder is like the front portion of the type A crank grinder, while the rear portion is similar to the type B plain grinder. All pins of a crankshaft may be ground without removing it from the machine. Two sizes, 16x32 in. and 16x42 in., are available.

Crank-carrying fixtures with hydraulic work clamps are provided. Either a dynamic or solenoid brake is provided to



prevent the work from drifting. A hydraulic workrest is rigidly attached to the bed so that it is directly in front of the grinding wheel, regardless of the pin being ground. The jaws are advanced hydraulically also. The final adjustment is made by adjusting screws.

The indexing plate is incorporated into the work-carrying fixture and locates the shaft radially. Spacing is accomplished by a rigid bar on which proper space lugs are located. To prevent the shock and vibration attendent upon carriage traversal, a hydraulic cushion is provided. Any carriage traverse speed from 12 to 360 in. per min. is available. The wheelhead is equipped with a 36-in. grinding wheel mounted on an alloy steel spindle. The hydraulic feed is controlled by several levers, the speed of the infeed after the wheel comes in contact with the work being regulated by means a dashpot. Positive stops are provided.

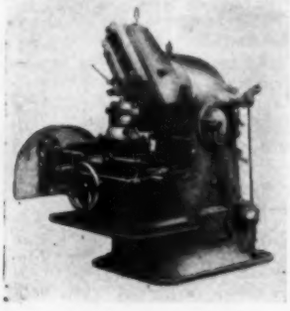
The main drive motor is of 25 hp., either a.c., or d.c. Coolant is supplied by a centrifugal pump.

— 42 —

Grinding Machine, Gear, Rapid, Type ASH-1, Maag

Niles Gear Co., Div., Niles-Bement-Pond Co., 111 Broadway, New York, N. Y. [Vol. 70,p.376]

Roughing and finishing of change wheels for automobile gearings is one of the jobs that can be done on the Maag Type ASH-1 rapid gear grinding machine introduced into the United States by the above company. The unit was especially constructed with an increased number of strokes for the cutter slide. Nine cutting speeds are provided. Change gears are all hardened and ground, and are built into the body of the machine. Fifteen different speeds can be obtained while the machine is running by altering the leverage by means of a screw.



The largest size spur gear that can be cut is 13.25 in., and the maximum width is 3.4 in.. the maximum pitch being 6. For the pressure angles of 15, 30, 45 and 60 deg., the maximum diameters that can be cut are 7.6, 8.75, 7.6 and 6.4 in., respectively. The maximum widths are 3.25, 2.85, 2.25 and 1.9 in., respectively. The maximum stroke of the tool is 4.2 in. and in its highest position it is 12 in. above the table. The adjustment is 7.6 inches.

Floor space required, 68x45 inches.

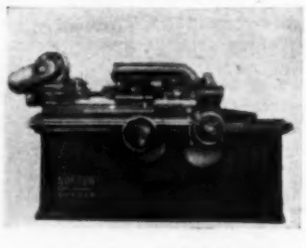
— 43 —

Grinder, Cam, Radial-Engine

Norton Co., Worcester, Mass. [Vol.70,p.412]

Because cams for radial airplane engines are generally much larger than automobile cams and have contours with re-entrant curves adjacent to the several lobes or high points, so that ordinary cam grinders are unsuitable, a machine capable of grinding such cams up to 10 in. in diam., and having 1¼-in. lifts has been developed. Wheels from 1⅜ to 2½ in. in diam. and running at 3,700 to 6,700 r.p.m. are used.

The machine consists of the base and the tables of the standard type A 10x24-in. plain cylindrical grinder, a special wheelslide carrying a small high-speed spindle driven by belt from a motor mounted on the slide, and a standard attachment for the grinding of loose cams. A pair of loose cams is



mounted in a special headstock having an extra speed reduction in order to obtain the very slow speeds required. The headstock is driven by a ½-hp. adjustable-speed motor. A lever swings the cam away from in front of the grinding wheel while making changes in the position of the cam roller.

When two cams are ground successively, a convenient lever moves the master cam roller from one master cam to the other. Wheel feed is obtained through the standard feed mechanism used on all Norton cylindrical grinding machines. The amount of coolant pumped to the wheel is 20 gals. per min. Three motors are used, one for pump, one for wheel spindle, one for headstock.

Floor space required 6x5 ft. Weight 6,200 lb. net.

— 44 —

Grinder, Knife, Reversible, Type W

Samuel C. Rogers & Co., 191 Dutton Ave., Buffalo, N. Y. [Vol.70,p.569]

Grinding of knives either against or away from the cutting edge can be done on the Type W full-automatic reversible grinder. The travel of the knife carriage and the cross feeding are entirely automatic, although hand cross-feed can be obtained by means of the center handwheel. The machine is built in five sizes to take knives

from 26 to 54 in. long. A 10-in. cup wheel is used.

Either straight or concave bevels can be ground and the machine can be operated fast or slow as desired. An index is provided for gaging the degree of bevel. The machine is provided with stops to regulate the travel. All sizes can be furnished with plain or ball bearings on the arbor, and with a built-in motor or belt drive.

Floor space required ranges from 5 ft. 6 in. by 2 ft. 6 in., to 10 ft. by 2 ft. 6 in. All sizes require a 1-hp. motor. Weights range from 640 to 1,150 pounds.

— 45 —

Grinding and Polishing Machine, Four-Wheel, Automatic, No. 26

Excelsior Tool & Machine Co., East St. Louis, Ill. [Vol. 70,p.720]

For rough grinding, polishing, or buffing flat or semi-flat articles, this four-wheel grinding and polishing machine has been developed. The work is placed in containers or on a magnetic chuck on the revolving table.

On each unit the wheel-spindle guard, wheel-truing attachment, and belt-tightening device are self-contained and adjustable at any angle. Speeds range from 1,800 to 3,000 r.p.m. A handwheel adjustment in front of each unit provides for regulating the height from the table to the wheel. The wheels can be raised from the work and automatically locked, so that they can be changed without interfering with production. Each

unit is balanced by adjustable weights.

Table feeds are 5, 9, and 13 lineal ft. per min. The machine is of dustproof construction throughout and has an exhaust system for dust removal.

The motors used are 10 hp., 1,800 r.p.m., with dustproof ball bearings, and normally are of the a.c. type for use on 3-phase, 60-cycle, 220- or 440-volt circuits. Wheel capacity is 16 in. in diam. by 6-in. face, and 1¾-in. hole, and the speed can be selected to suit. Size of the machine is: Height overall, 10 ft.; circular feed table diam. 72 in., width of table 10 in.

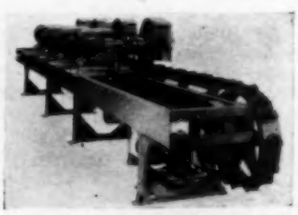
Weight 12,000 pounds.

— 46 —

Grinding, Buffing, and Polishing Machine

Kent-Owens Machine Co., Toledo, Ohio. [Vol.70,p.838]

Any number of grinding heads can be provided on this grinding, buffing, and polishing machine and, furthermore, on a machine having two or more heads, half of the spindles may be operated at proper speed for new wheels and the other half for worn wheels, thus maintaining correct surface speeds. Individual motors drive each spindle through V-belts. The spindles are mounted on ball bearings in dustproof housings. Wheel pressure on the work is conveniently adjustable from zero to 200 lb. Further, the wheels may be set at any angle



up to 10 deg., either to the right or left of the line of work travel.

The work-carrying belt is steel faced and rides upon roller bearing supports beneath the wheel contact area. Specifications are as follows: Width of the conveyor belt, 7 to 10 in., speed of belt, 27 ft. per min.; diam. of wheels, 16 in. maxi-

mum; spindle speed, 2,100 to 2,600 r.p.m.; motor size, 10 hp. at 1,800 r.p.m.; conveyor motor, 2 hp. at 1,200 r.p.m.; center distance between spindles, 38 in.; working height, 35 in.; overall width with 7 in. conveyor belt, 49 in., with 10 in. conveyor belt, 52 in.; overall length for work up to 12 in. long, for four-wheel machine, 17 ft. 5 in., ten-wheel machine, 36 ft. 5 in.; weight, four-wheel machine, 8,100 lb., or ten-wheel machine, 19,600 lb. Conveyor belt speeds from 17 to 45 ft. per min. can be furnished.

— 47 —

Grinder, Naval Gun, Model MP

Hutto Engineering Co., Detroit, Mich. [Vol.70,p.954]

Gun barrels up to 61 ft. in length and 16 in. in bore can be ground at 6 ft. steps. Work starts at the breech and as each 6 ft. is inspected and passed a length of the universal is removed. The wet grinding process is employed, kerosene

being the coolant. Grinding is done by means of a tandem grinder equipped with 5-in. stones at either end. It is claimed no error greater than 0.001 in. will be made.

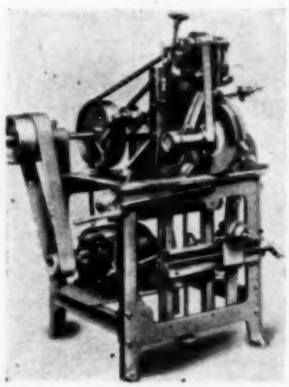
The grinder is driven by a 7½-hp. motor and has a 6-ft. stroke. Electrical controls are provided for reciprocating knock-offs. The machine is supported by jacks under the control box after elevating and during grinding.

— 48 —

Grinder, Circular Saw, Automatic, Model G-111

Foley Saw Tool Co., Inc., Minneapolis, Minn. [Vol.70,p.956]

Grinding and rejointing in the same operation of all metal-cutting circular saws from 6 to 30 in. in diam. having either straight or Cochran-Bly teeth



can be done. All teeth having from ¼ to 2 in. spacing can be ground. The unit automatically brings high and low teeth to an even size and height as it grinds them to a cutting edge.

The machine is durably constructed and is inclosed, so that filings, dust, and emery cannot work into the moving parts. Either belt or motor drive can be supplied.

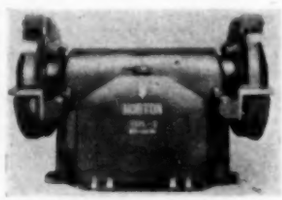
— 49 —

Grinders, Floorstand 24- and 30-Inch, Type S

Norton Co., Worcester, Mass. [Vol.70,p.35]

A combination high-speed floorstand and grinder that can be used with either 24- or 30-in. wheels, and having an a.c. or d.c. motor mounted in the base, has been developed. Overlapping protection hoods of ⅜-in. boiler steel plate insures safety for the operator. Wheels are operated at 9,000 f.p.m. The hoods are hinged and can be adjusted to suit wheel wear, as well as the degree of wheel exposure. A spark deflector is also provided.

The base is heavy, allowing footroom for the operator, and provides for a large amount of



chips directly under the point of grinding. The spindle is mounted on two double-row ball bearings, and lubrication of the whole machine is by four centralized Alemite connections. Optional equipment includes multiple V-belts for three speed changes, or silent chain for constant speed. A 15-hp. motor is specified for 30-in. wheels, and a 10-hp. size for the machine when 24-in. wheels are used.

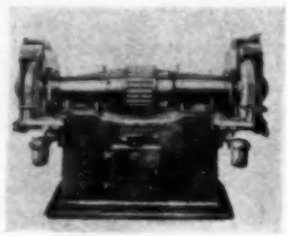
— 50 —

Grinder, Floorstand, Motor-Driven, 20-Inch

Diamond Machine Co., 9 Codding St., Providence, R. I. [Vol. 70,p.222]

A distance of 54 in. between the two 20-in. wheels of this motor-driven grinder permits two men to work at the same time. The motor driving the wheels is of 7½ hp., and runs at 1,150 r.p.m. It has a corrugated frame with special end pieces for thorough ventilation by means of vent holes in the column. The motor is mounted in ball bearings.

Height of the spindle from the floor is 32 in. The two



20x2-in. wheels are mounted within heavy iron Safety Code guards with adjustable wings for wheel wear. Tight and loose rests are provided. The base is 50x17½ in. and the overall width is 68 inches.

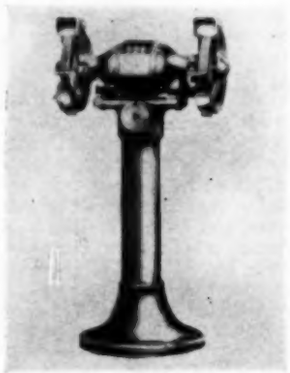
— 51 —

Buffers and Grinders, Bench and Floorstand, Air-Cooled

Sterling Electric Motors, Inc., Telegraph Road at Atlantic Blvd., Los Angeles, Calif. [Vol. 70,p.453]

Pedestal models of these buffers and grinders comprise a two-wheel grinder such as illustrated, a combined grinder and buffer, and a buffer and polisher with an extended shaft. Three bench models are also available, these being a grinder with wheels only, a grinder equipped with guards and toolrests, and a grinding, polishing and buffing motor only.

The pedestal models are avail-



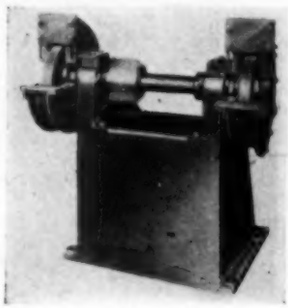
able in sizes up to 1½ hp. in single-phase types, and up to 2 hp. for three- or two-phase circuits. The first two types of bench grinders are available in ½-hp. sizes only, while the polishing motor is available in sizes up to 5 hp. Air cooling of the motor and the use of ball bearings are features.

— 52 —

Grinders, Floorstand, High-Speed, Type B

Kling Bros. Engineering Works, 1300 N. Kostner Ave., Chicago, Ill. [Vol.70,p.454]

Designated as Type B, these grinders are available in bench and floorstand types. They are made with cast frames of semi-steel, using cored construction. Wheel shafts are 0.40 carbon steel finished all over and fitted with "Super-Strom" double-row radial ball bearings. Chucks are of cast steel, finished and balanced. Wheelguards are of fabricated steel. Bearings are



of the fully-inclosed labyrinth type. The drive pulley is rubber covered to prevent slippage.

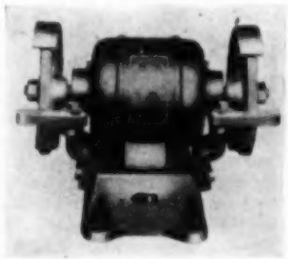
These units are made for use with 18x2x7-in. rubber-bonded or Bakelite grinding wheels for high-speed rough grinding and snagging and operate at a peripheral speed of 9,000 ft. per minute.

— 53 —

Grinder, Bench, 6-Inch

United States Electrical Tool Co., Cincinnati, Ohio. [Vol.70, p.374]

Fine and coarse wheels 6x½x½ in. are placed on this grinder, which is furnished with adjustable toolrests and complete electrical connections. It is driven by a ½-hp. motor running at 3,450 r.p.m. Other features are the heavy nickel-steel spindle and the ball bearings used for the spindle mounting. The grinder is furnished regularly for 110-volt, 60-cycle circuits,



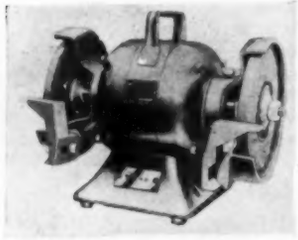
but it can also be furnished in 220-volt, 2- and 3-phase models, and also in 110 and 220-volt d.c. models at extra cost.

— 54 —

Grinder, Bench, 6-Inch

Van Dorn Electric Tool Co., Cleveland, Ohio. [Vol70,p.1026]

This bench grinder has been built for tool dressing, sharpening hand tools, and light grinding of all kinds. It is portable, weighs only 36 lb., and has a convenient handle. Rubber pads are fitted on the base to elimi-



nate bolting the grinder to the bench for light work. The shaft is mounted on ball bearings with dustproof housings, and the motor is also completely inclosed and can be operated from the lighting circuit. The grinder is equipped with two 6-in. grinding wheels, wheel guards, toolrests, 3-wire cable, and a plug.

— 55 —

Grinders, Tool, High-Speed, Diemakers

Forbes & Meyers, 172 Union St., Worcester, Mass. [Vol.70, p.533]

Several high-speed grinders in sizes from ¼ to 2 hp. and intended especially for diemaker's use have been placed on the market. Grinders from ¼ to 1 hp. are available for operations at 25,000 r.p.m., while for sizes between 1 and 2 hp. the speed limit is 12,500 r.p.m. The

¼-hp. model carries a ¾x¾-in. wheel and a ¼-in. shaft. Spindles may be single- or double-ended at the option of the purchaser.

In these grinders, both the rotor and the wheel are mounted on the same shaft. The rotor is of welded construction. The current required for the operation of the machine is obtained from a frequency changer. Ball bearings are furnished on the spindles, and they are lubricated by means of an automatic oil feed.

— 56 —

Grinder, Tool, Precision, Olofson

Progressive Tool Co., Fenton, Mich. [Vol.70,p.685]

For the accurate grinding of tools, semi-circular slots, and similar die-room and toolroom jobs, this Olofson precision grinder has been introduced. It can be used on any one of the standard vertical or horizontal boring machines, milling machines, and drill presses, by means of tapered shanks. The part to be ground is clamped in a vise or on a machine table, moved into position with the grinder for the grinding operation, and not removed from the clamp until the work is completed. A special adapter in combination with a holder for insertion in a toolpost enables the grinder to be used for internal grinding operations in a lathe. This attachment is furnished extra.

The motor is of the universal

type, operating at 10,000 r.p.m., the spindle being mounted in ball bearings. The quill is removable and runs true to a high degree of accuracy.

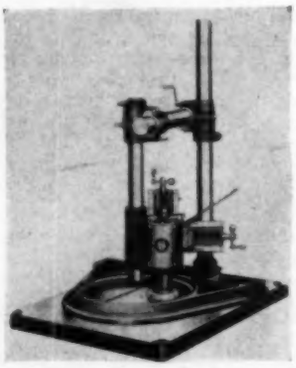
Through the graduated dial adjusting screw near the top, working in conjunction with the slide, an offset adjustment is made that results in an eccentric travel of the grinding wheel. This adjustment allows for a 1 in. variation on the diameter.

— 57 —

Grinding Machine, Surface, Die Block, 24-Inch

United States Electrical Tool Co., Cincinnati, Ohio. [Vol.70, p.1030]

Especially designed for surfacing die blocks, grinding manholes, and flat work of all kinds within a minimum circumference of 24 in., this electric grinder has been developed. It is provided with a 2-hp. Westinghouse motor running on SKF ball bearings. The base of the machine is square and its sur-



face is 36x48 in. It is provided with T-slots. The slots start from the rear and extend about three-fourths of the way across the base.

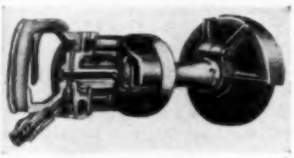
The arm holding the grinder is of 3-in. cold-rolled steel and the grinder mounting collar is equipped with ball bearings top and bottom. The mounting has two adjustments, a vertical one of 6 in., and a horizontal one of 8 in. The machine is equipped with a 6-in cup wheel.

— 58 —

Grinders, Portable, "Hercules"

Buckeye Portable Tool Co., Dayton, Ohio. [Vol. 70, p. 529]

Principal characteristics of the line of "Hercules" portable air tools, consisting of grinders, bumpers, and drills, are: Freedom from vibration, smooth,



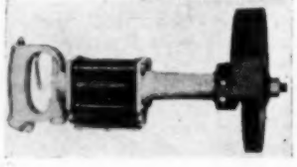
even speed, obtained through the patented air port construction, and low air consumption. Interchangeability of parts, especially handles, permits machines of the same capacity to be changed from the grinder as illustrated, to a buffer or drill.

— 59 —

Grinder, Portable, High-Production, No. D-3

Rotor Air Tool Co., 5905 Carnegie Ave., Cleveland, Ohio. [Vol.70,p.530]

Designed for use with 8x1-in. high-speed rubber, Bakelite, and elastic-bonded wheels, this high-production grinder provides a wheel surface speed of 9,000 ft. per min. A patented



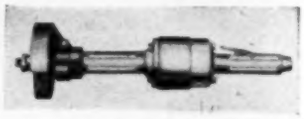
rotor governor has been developed to control the speed, regulating the intake air and keeping the machine at constant speed of 4,300 r.p.m. under load. The machine is furnished as standard with a straight or spade-type handle. Weight 16 lb. with guard.

— 60 —

Grinder, Portable Pneumatic, Multi-Vane

Ingersoll-Rand Co., 11 Broadway, New York, N. Y. [Vol. 70,p.569]

Smooth running because of the multi-vane construction is a feature of this grinder, which is claimed to be the lightest portable model made in this capacity. By means of the governor, the speed can be adjusted so that any amount up to 6,300 r.p.m. can be obtained. Standard machines are set at 4,200 r.p.m., which is the best rate for 6-in.



vitrified and 8-in. elastic-bonded wheels.

Four power vanes are used on the rotor, which is made of steel, hardened and ground, and which has a full-floating fit on its arbor. An exhaust deflector serves as a muffler.

The wheel has two radial ball thrust bearings. From an oil chamber in the handle of the tool, lubricant is fed automatically into the air going into the machine every time the grinder is stopped and started. Thus it keeps all wearing parts running in an oil film. The machine can be fitted with various types of grinding wheels and brushes for grinding, buffing, polishing, or cleaning work of various types. Two forms of handles are furnished, a squeeze-type straight handle or an inside trigger grip handle.

— 61 —

Grinder, Portable Rod, "Thor"

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill. [Vol.70,p.722]

This rod grinder is used for surfacing locomotive frame jaws, rods, straps, rod brasses, shoes and wedges, and other

parts. The wheel guard is made small enough in diameter to get into a 2½ in. space. The unit is available in two wheel lengths, 6 and 9 in. The 6-in. size has a speed of 7,000 r.p.m., weighs 21½ lb., and is 26 in. long. The 9-in. model has a speed of 7,000 r.p.m., weighs 23¾ lb., and is 29 in. long.

— 62 —

Grinder, Swing-Frame, Ball-Bearing-Equipped

Kinney Iron Works, Los Angeles, Calif. [Vol.70,p.225]

Simple and sturdy design is the feature of this swing-frame grinder, which is especially adapted for snagging, oil-tool

dressing, and rail and frog grinding. The motor is connected directly to the wheel through a flexible coupling and heavy shaft. Both ends of the shaft are mounted in heavy, dustproof ball bearings. The motor is suitable for either two- or three-phase operation on 220 or 440 volts.

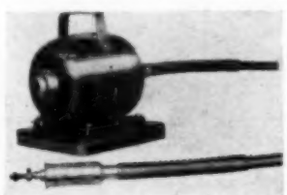
The wheel guard may be rotated easily so that either side of the wheel is exposed. The grinder is suspended by a sliding collar, which permits balancing the machine as the wheel wears. Maximum wheel size that can be used with the 5-hp. model is 18x3 in., while a 24x3-in. wheel can be carried with the 10-hp. model. Overall length without the handle, 7 ft. 9 inches.

— 63 —

Grinder, Flexible Shaft

Peerless Electric Co., Warren, Ohio. [Vol.70,p.225]

Three types of mountings are provided for this flexible shaft grinder. These are a pedestal mounting, a trolley mounting for overhead monorail service, and a portable type bolted to a plate. The flexible shaft is driven by a ½-hp. motor, suit-



able for operation on the 110- or 220-volt, 60-cycle circuits. The motor speed is 1,750 r.p.m., but it can be furnished for operation at 3,500 r.p.m. The largest grinding wheel that can be carried is 5x¾x¾ in. Shipping weights of the portable and trolley types are 75 lb., and that for the pedestal type is 200 lb. net.

— 64 —

Grinders and Buffers, Flexible-Shaft

Stow Manufacturing Co., Inc., Binghamton, N. Y. [Vol.70,p.954]

Two types of flexible-shaft units are available, one for metal working and the other for paint shop operations. The metal-working assemblies are suitable for die-sinking, pattern work, grinding, polishing, and sanding, and many types of attachments may be obtained. The model M-230 is equipped with a ¼-hp. motor and a 7-ft. flexible shaft, clamp spindle for wheels, a 1¼-in. chuck and several grinding wheels and belts. Model M-235 is similar, but is equipped with a ½-hp. motor.

The paint shop unit, Model

L-180, is for refinishing purposes and is equipped with a ¼-hp. motor, a 7-ft. shaft, and angle head with 6-in. flexible-back polishing pad and sheepskin. The model L-185 has a ½-hp. motor and similar accessories.

— 65 —

Exhauster Equipment for Grinding Wheels

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.70,p.338]

This ball-bearing, motor-driven exhauster equipment can be supplied for use with Hisey grinders of 10-, 12-, and 14-in.

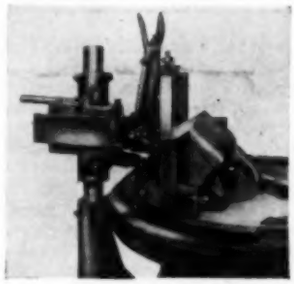
wheel capacity. It can also be supplied for the company's buffing and polishing machines of 8-, 10-, 12- and 14-in. wheel capacity. The automatic motor starter controls both the exhauster driving motor and the grinding wheel driving motor.

— 66 —

Worktable for Disk Grinder, Swinging, Hand-Operated

Gardner Machine Co., Beloit, Wis. [Vol.70,p.533]

Whereas by itself a disk grinder will produce only a flat surface without accurate relation to any other surface of a casting, by the addition of this hand-operated swinging worktable two surfaces can be produced either at 90 deg. or any other angle between them. The table pivots on a shaft carried in a bracket fastened to the machine base. The guard ring of the machine is cut to provide an opening of the extent required by the size of the parts to be swung across the wheel. By means of a locking hand lever, the table is raised from and lowered onto the grinding wheel, spring tension providing the necessary pressure against the wheel during the operation. Longitudinal adjustment from the column is available by means of the horizontal slide



bar, and vertical adjustment is readily obtained by raising or lowering the rocker box on the pivot shaft.

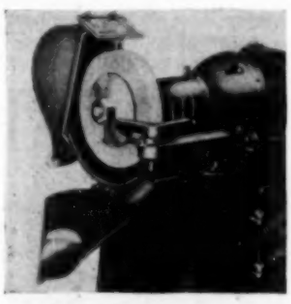
The surface of the worktable is 8x14½ in.; horizontal adjustment, 7 in.; vertical adjustment, from 0 to 4 in. The swinging worktable may be applied to either the belt-driven or the motor-driven No. 86 grinders.

— 67 —

Wheel Guards for "U. S." Grinders, Improved

United States Electrical Tool Co., Cincinnati, Ohio. [Vol.70, p.880]

An improvement on the line of heavy-duty grinders manufactured by the above company is the wheelguard illustrated.



This guard is of the hinged-door type, adjustable to wheel wear. When adjustments are made, the exhaust connections remain stationary. It will be noted that the guards are made of heavy sheet steel and are readily opened up, yet give complete protection.

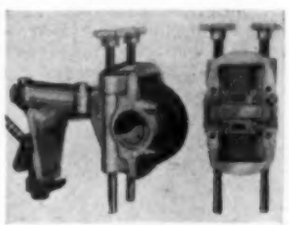
Exhaust is through connecting tube mounted on bottom segment of guard, into removable box within base of machine. Two movable sections of guard do not affect exhaust when opened.

— 68 —

Dresser, Wheel, for Cylindrical Grinding Machines

Ross Manufacturing Co., Cleveland, Ohio. [Vol.70,p.188]

The hub design of this tool is a departure from previous ball-bearing types in that the inner instead of the outer bearing races revolve, thus attaining a 40 per cent decrease in ball speed, an adding to the life of the bearings. Larger balls and "precision" machine tool bearings mounted in hardened and ground steel cartridges are said to give 60 per cent more load-carrying capacity. Bearings are of the closed type, thus avoiding initial load and the necessity for later adjustment by the operator.



One bearing is fixed, while the other floats. The hub axle is made in one piece. Four washers, two of felt and two of specially-treated cork, are employed to seal the bearing and keep out foreign matter.

A feature is that dressing wheels may be replaced without disturbing the bearing assembly of the tool. The tool has two adjustable steadyrests, giving three-point support and permitting tilting.

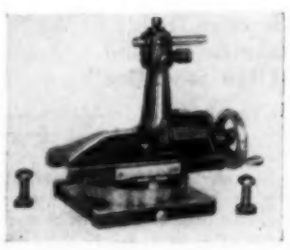
— 69 —

Wheel-Truing Attachment, Radius and Angle

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.454]

This radius and angle wheel-truing attachment is intended for use on the No. 2 surface grinding machine made by the above company. It is particularly useful when grinding such work as lamination dies, flat forming tools, and miscellaneous pieces requiring wheels having radial or angular faces.

The attachment consists of a



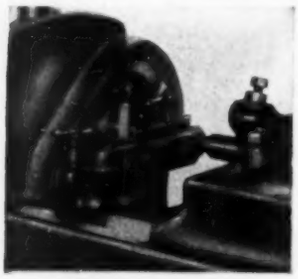
base of cast iron graduated to 90 deg. on either side of zero, and carrying a swivel platen. A slide, which can be adjusted longitudinally by a handwheel to 64ths either side of zero, is mounted on this platen. An upright integral with the slide, holds the diamond tool and the setting gage. Outlines having concave or convex radii varying from 0 to 1 in., and face angles up to 90 deg. either side of zero, can be formed.

— 70 —

Dresser for Stepped Grinding Wheels

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.647]

This wheel-truing device for stepped wheel dressing has been developed for use on the plain grinding machine described on page 221, vol. 70, of the *American Machinist*. The dresser provides a quick and accurate means



for sizing two different diameter wheels used for plunge cut grinding on two diameters of work. A feature is that it redresses the wheels in minimum time and leaves the machine set for correct sizing of the work.

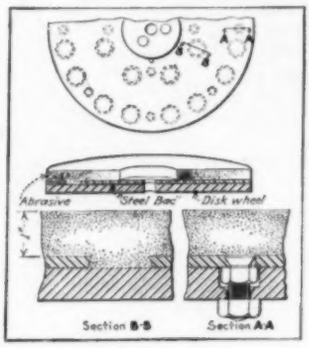
The wheel truing diamond nib is set at one end of the diamond slide, which is mounted at the front end of the device. At the opposite end of the slide is an adjusting screw for controlling the sizing of work. When in use, one end of this device is mounted between the work centers of the machine and the other is clamped to a plate bolted to the swivel table. In a rectangular opening is mounted a gage consisting of two hardened disks. The difference in the diameters of the two disks equals the difference in the diameters of the work. Should other diameters be desired the disks can be removed and reground.

— 71 —

Abrasive Disk, Bakelite-Bonded, "Titan Steel-Bac"

Charles H. Besly & Co., 118-124 N. Clinton St., Chicago, Ill. [Vol.70,p.73]

Intended for both wet and dry grinding, this "Steel-Bac" abrasive disk consists of a comparatively thin steel plate on



which the abrasive is built. This plate is bolted to the steel disk wheel of the grinder, and when the abrasive is worn off, the plate is returned to the manufacturer, the abrasive rebuilt, and the unit sent back.

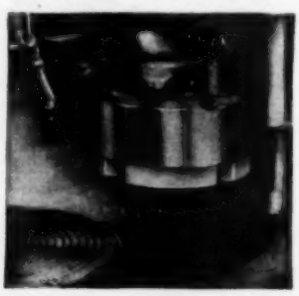
The abrasive is held to the steel plate by means of a series of undercut holes drilled in the plate and by a special Bakelite cement. A series of studs are provided to secure the Steel-Bac to the disk wheel of the grinder. A wide grinding zone, which is desirable in most disk grinding, is obtainable by the use of this wheel. Five sizes are manufactured, 18, 20, 23, 26 and 30 in. in diameter.

— 72 —

Grinding Wheel, Segmental, for No. 10 Surface Grinder, 11-Inch

Blanchard Machine Co., 64 State St., Cambridge, Mass. [Vol.70,p.607]

This 11-in. segmental grinding wheel is similar in construction to the 18-in. wheel described on page 555, vol. 69, of the *American Machinist*. It is intended for application to the No. 10 surface grinder. The wheel consists of a chuck body carrying four abrasive segments with rounded ends. The face of the body has a circular channel



separated into two halves by means of two fixed partitions. Two wheel segments are placed in each half, and are held in position by means of a clamping unit between them.

The body is cadmium plated, and all of the parts are made of aluminum bronze except the screw, which is of stainless steel. Abrasive segments 5 in. deep when new are used, and of this length 4 in. can be worn down.

— 73 —

Lapping Compounds, Carborundum

Carborundum Co., Niagara Falls, N. Y. [Vol.70,p.719]

Twenty-two grades of finishing compound for lapping gears, bearings, and other mechanical moving parts have been introduced. Carborundum (silicon carbide) and Aloxite (fused alumina) are the manufacturing abrasives used, the former for finishing of hardened metals, particularly gears, and the latter for the lapping and finishing of softer metals. The abrasive grains are accurately graded to size and in minute powders, and classification is carried out under microscopic control.

The carrier medium used is a special compound having the characteristics of a mixture of oil, grease, and water. The advantages claimed for the carrier medium are that it is unaffected by temperature changes, holds the abrasive grain in unchangeable suspension, provides cool-cutting action and high speed of cutting, and prevents grain marks showing, is nonflowing, non-dripping, and noncorrosive, will not affect the operator's skin, and finally does not requuire the use of a cleaner that is explosive.

Advantages claimed from the use of Carborundum brand finishing compounds are that bearings lapped with them present from 75 to 90 per cent metal-to-metal contact and that the lapping time is from ¼ to ½ less than that required by the scraping process. Kerosene is the cleaning medium recommended for use with the compound.

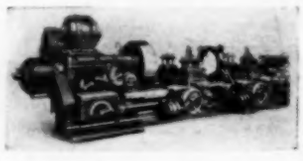
Lathes

— 74 —

Lathe, Roughing, Extra-Heavy, 36-Inch, Betts-Bridgeford

Consolidated Machine Tool Corporation, Rochester, N. Y. [Vol.70,p.261]

Rapid rough turning of heavy forgings can be done on this machine, which is driven by means of a 40-hp. motor through hardened steel gearing giving nine speed changes. Six of the nine speeds are obtainable through steel internal faceplate gears and steel faceplates, and three through the spindle. A powerful disk clutch is incorporated in the drive, and is controlled from both carriages. Four speed changes are obtain-



able through sliding steel gears running in oil.

Two carriages are provided on the lathe, each equipped with independent front and rear toolrests of extra-heavy construction. The toolrests have square guides, and are held in position by heavy gibs. Both can be adjusted independently by hand or power. Independent power rapid traverse of the two carriages is afforded by means of small motors mounted on the aprons. Power feed and rapid traverse are also provided to the cross-slide. The compound rest may be set parallel with the bed.

The steadyrest and follow rests are equipped with roller-type jaws.

— 75 —

Lathes, Geared-Head, Quick-Change, 12- 14- and 16-Inch, Redesigned "Economy"

Rockford Machine Tool Co., Rockford, Ill. [Vol.70,p.411]

This redesigned line of heavy-duty lathes is intended to handle rapid production by maintaining simplicity of construction and accuracy essential for toolroom purposes. The swings over the carriage are 6¾, 8, and

11 in., respectively, for the 12-, 14- and 16-in. sizes. The quick-change gearbox gives 32 changes of feeds and threads, obtained through sliding gears. Standard threads from 4 to 56 and feeds from 18 to 252 per in. may be obtained.

The geared headstock is driven by a single pulley and provided with twelve spindle speeds in geometrical progression, ranging from 15 to 400 r.p.m. The 12- and 14-in., sizes are equipped with Timken roller bearings on all driving shafts, the spindles running in bronze bearings and ball thrust bearings. The 16-in. size is Timken equipped throughout. Power is transmitted from a motor in the cabinet base to the spindle pulley, a twin-disk clutch being provided. On the 16-in. size apron control of the clutch and brake is provided in addition to the standard lever.

The tailstock is of the offset

type, and it is provided with a set-over for turning tapers. By means of a thread cutting indicator the operator may catch any pitch of thread desired without reversing the lathe. All feeds are reversed in the apron and interlocked in the bronze leadscrew nuts. Power required ranges from 1 to 1½ hp. for the smallest size to 2 or 3 hp. for the largest size.

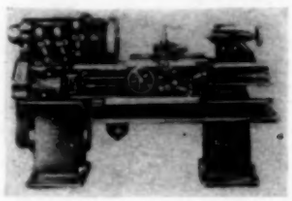
— 76 —

Lathe, High-Speed

Monarch Machine Tool Co., Sidney, Ohio. [Vol.70,p.876]

To meet the demand for lathes that will operate smoothly and quietly at much higher than normal spindle speeds, this line of lathes has been developed in sizes from 14- to 36-in. swing, and providing maximum spindle speeds from 600 to 1,500 r.p.m. Helical gears and Timken bearings are standard. The units are particularly designed to be used with tungsten carbide cutting tools, such as Widia and Carboloy. On this high-speed lathe, cast iron is being turned at 500 to 700 ft. per min., and other materials in proportion.

Tests show that at least twice



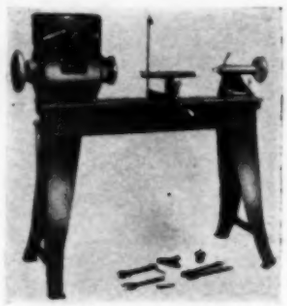
the power is required for these lathes as for ordinary lathes operating at normal speeds, and the machines have been built to take care of this extra power. In spite of the extra power required, however, the machine is more economical than the standard type because of the greater amount of metal removed per unit of power.

— 77 —

Lathe, Headstock, Patternmakers, Motor-Driven, Unit-Type No. 51

Oliver Machinery Co., Grand Rapids, Mich. [Vol.70,p.607]

Adjustable and four-speed, unit-type, motor-driven headstock lathes, designated as No. 51, and suuitable for patternmaker's use in particular, have been developed by the above company. The construction of the unit head on each type is such that all control mechanisms are placed over the motor, and are inclosed. The adjustable-speed headstock lathe of ½-hp. capacity provides speeds ranging from 600 to 3,600 r.p.m. whereas the four-speed, ½-hp. headstock unit gives speeds of 600, 1,200, 1,800, and 3,600 r.p.m. Both types have capacities of 12



in. over the bed and 9½ in. over the carriage, and will turn work 24 in. between centers on a 48-in. bed or 36 in. on a 60-in. bed.

The adjustable-speed lathe will operate on single or polyphase circuits having frequencies lying between 25 and 60 cycles. A governor of the centrifugal type is built in as part of the motor. Speeds may be varied by turning the control handwheel. The inside of the spindle is threaded for a faceplate, and the outside end carries an "Oliver" patented combined handwheel and faceplate.

The bed may be obtained in 48- or 60-in. lengths. A hand-feed tool carriage with cross feed and compound swivel may be furnished. The apron has a travel of 37 in. on a 60-in. bed. Traverse of the cross feed is 5½ in. The compound rest carries the slotted toolpost and has a traverse of 3½ in. Its socket base is graduated and swivels on the cross-slide.

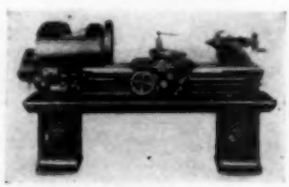
— 78 —

Lathe, Screw-Cutting, Double-Backgeared, 16-Inch

Porter-McLeod Machine Tool Co., Hatfield, Mass. [Vol.70, p.223]

Forty different thread pitches can be cut. These pitches range from 2 to 56 threads per in., and the largest diam. that can be held in the split chuck is 1 in. The swing over the carriage is 10 in. and the distace between the centers, when a 6-ft. bed is furnished, is 33 in. Lathes can also be furnished with 5-, 7-, 8-, and 10-ft. beds.

The headstock is of full box section with internal ribbing and the spindle bearings are large



size. These bearings can be furnished either in bronze or with Timken roller bearings. The spindle is bored 1⅞ in. throughout, and is heat-treated. The tailstock is of the cut-away pattern.

The apron has been entirely redesigned. It has double walls, and is arranged so that all gears run in an oil bath. Friction devices are provided for both the longitudinal and cross feeds. The quick-change gearbox is a unit mechanism bolted on to the bed. All the gears and clutches are steel.

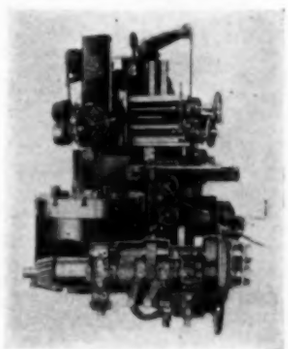
Regular equipment consists of two cabinet legs, one large and one small faceplate, one center rest, one follow-rest, two centers of tool steel, toolpost, countershaft, and wrenches. The weight on skids is 2,100 lb. A 13-in. size is also manufactured.

— 79 —

Lathe, Turret, Vertical, Redesigned

Bullard Co., Bridgeport, Conn. [Vol.70,p.951]

The "Spiral Drive" type vertical turret lathes have been modified to increase their capacity and ability to operate beyond the demands of the latest cutting materials. Spin-



dle speeds have been increased and the recommended horsepower for motor drive has been selectively raised with adequate strengthening in construction. The nature of faceplate work and the various diameters to be encountered determine the operations at higher peripheral speeds that justify the use of cutting tools such as tungsten carbide, whereas the smaller diameters machined at necessarily lower peripheral speeds would not, under simultaneous operation, require more than the regular type of high-speed cutting tools.

The secondary speed change case is now designed with a complete train of balanced spiral and helical gears controlled in thrust and providing a smooth cutting action. This secondary case combined with the standard primary one provides variously eight and twelve different rates of speed through the respective sizes of the machine in which it is applied. The table speeds, though varying with each size of machine, offer reasonable minimum diameters of work at which tungsten carbide and similar tools can be employed under maximum efficiency of operation.

— 80 —

Lathe, Automatic, Fay, 24-Inch

Jones & Lamson Machine Co., Springfield, Vt. [Vol.70,p. 717]

Work up to 24½ in. in diam. can be swung on this 24-in. Fay single-spindle automatic lathe. The increase in size over the standard Fay automatic, which swings work 14¾ in. in diam., permits additional facilities for mounting tools and attachments, thus making it possible to finish completely more complicated pieces in one setting than is now possible on the smaller machine. The 24-in. model is similar in construction, but is heavier, larger, and more powerful in construction.

It may be equipped for center work or for chuck work, and is particularly well adapted to the machining of tractor parts, large automobile parts, flywheels, pipe flanges, large ball and roller bearing races, and spur and bevel gears. According to the manufacturer, the 24-in. size is so easy to set up on simple work that it can be used to advantage on a variety of parts made in small lots. A complete line of tools with attachments have been designed for this machine similar to the equipment used on the present standard Fay automatic.

It is possible to bring a large number of tools into action at the same time on this improved type of machine, and heavy cuts may be taken. The machine illustrated has a length of bed that will take work up to 24 in. on centers. A flange with a taper pilot is provided on the headstock spindle, and fixtures, chucks and faceplates are mounted in such a way that they can be bolted to the outer section of this flange and located by a tight draw fit on the

taper pilot. The center bar and back bar extend the whole length of the machine, providing rigidity to both the carriage and the back arm.

An automatic speed-shift mechanism, which changes the spindle speeds automatically during the operation of the machine, may be provided on the headstock or it may be equipped with a sliding-gear type of transmission, in which case the spindle speeds are set by hand before the machine is put in operation.

The machine shown is approximately 10 ft. long overall, and 4 ft. wide. It weighs 14,000 lb. crated.

— 81 —

Lathe, Automatic, Model U, "Lo-Swing"

Seneca Falls Machine Co., Seneca Falls, N. Y. [Vol.70, p.912]

The "Lo-swing," Model U automatic has been introduced as a companion machine for the large Model R Lo-swing, described on page 419, Vol. 65, of the *American Machinist*. It is designed to machine the lighter types of steering knuckles, stem pinions, and side gears, both of aluminum and cast iron, and also to do second operation work on some larger parts.

When the machine is started, it makes a complete cycle and

stops with the carriage slides returned to the starting position. A single lever brings the tailstock center into position and starts the machine in operation.

When the machine is equipped for individual motor drive, the motor is mounted in the base of the machine, and drive is obtainable through belt or silent chain. Pick-off gears are provided for changing both speeds and feeds. Ball and roller bearings are provided for all shafts. All cams, gears, and other mechanisms in the head are lubricated automatically by means of a force-feed pump.

The way on which the carriage travels on the bed is equipped with a hardened and ground steel plate. The longitudinal and cross-feed movements of the front carriage slide, as well as the cross-feed movement of the rear forming and squaring slide, are obtainable by cams, which are hardened and ground. The machine will take work 5 in. in diam., and 12 in. long.

Weight 5,000 pounds.

— 82 —

Billet Pealer, Putnam

Shaw-Crane-Putnam Machine Works, Inc., Div. of Manning, Maxwell & Moore, Inc., Fitchburg, Mass. [Vol.70,p.492]

Round, unstraightened billets, up to 12 ft. in length and from 3½ to 12 in. in diam., can be turned down rapidly to a uniform depth on this billet pealer, which will produce 13,000 lin.ft. of the former size and 3,700 lin.ft. of the latter size in 24 hours of working time, the tonnages being 210 and 700, respectively. For all billet sizes the cutting speed is maintained at 40 ft. per min. The cut taken is ⅛ in. deep, and practically all of the surface defects are removed.

A small crane over the machine lifts the billets and places them in position, one end resting in the lower jaws of the entering side grip and the other end in the adjustable V-block. An automatic gripping device or chuck is incorporated in the design.

The discharge side grip is located at the right-hand side of the cutter head. With the grip shown it is necessary to stop the cutter head and release the entering grip before closing the discharge side grip on the billet. On machines to be built in the future, however, a universal discharge side grip is to be furnished. This type of grip will find and clamp the billet in whatever position it may be in due to its camber. It will not be necessary to stop the cutter head and release the entering

side grip before closing the discharge side grip. Operation of the machine will, therefore, be continuous.

The machine is fitted with a central cutter head. The entire tool assembly is self-contained and it may be quickly removed. The toolholder is arranged for six cutting tools, 3x2 in., and is driven by two large keys diametrically opposite.

Hydraulic feed is by means of a high-pressure pump and accumulator system, and a pressure of either 1,000 or 1,500 lb. per sq.in. is arranged for.

— 83 —

Scalping Machine, Ingot, Aluminum

Jones Machine Tool Works, Inc., 5300 Lansdowne Ave., Philadelphia, Pa. [Vol.70,p.493]

To obtain a perfectly smooth surface on aluminum ingots previous to reduction in a plate mill, the scalping machine illustrated was developed to remove scale, scratches, gouges, and tool marks, which would otherwise show up in the rolling process.

The machine carries a large diameter cutter head containing a single cutting tool, which feeds from the periphery of the cutter head toward the center. Since a fixed, fast cutting speed

must be maintained at all diameters, the cutter head is driven by means of a Waterbury oil pump, motor, and gearing so that the speed is increased automatically as the center is approached. The cutter head is mounted on a heavy spindle.

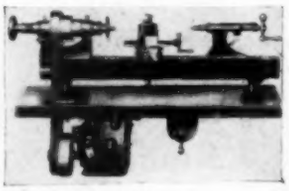
The ingots to be scalped are mounted on a four-sided turret, which is hand rotated and equipped with a quick-loading and clamping device. By loading all four sides of the turret, which is equipped with adjustable stops and clamps for various sized billets, the operator can keep the machine in almost continuous operation.

— 84 —

Drive Unit for Bench Lathes, Motor

Stark Tool Co., Waltham, Mass. [Vol.70,p.415]

This compact motor drive for bench lathes and bench milling machines of "Stark" and other standard makes is mounted beneath the bench on which the machine is located and drives



the spindle by means of a single belt. Six spindle speeds are available, three by shifting a lever and three others by using the other step of the cone driving pulley. These speeds may be reversed.

The motor drive unit has a built-in speed reduction and quiet operation is obtained by the use of non-metallic driving gears. The three shafts are mounted in Timken bearings.

Regular equipment consists of a baseplate, reduction gear, and flexible coupling. The motor and its control are extra.

— 85 —

Chuck, Elliptic, for Vertical Turret Lathes

Frew Machine Co., 124 W. Venango St., Philadelphia, Pa. [Vol.70,p.452]

Elliptical pieces weighing up to 800 lb. and of 18x16-in. cross-section can be turned out on the Bullard vertical turret lathe by means of this elliptical chuck. The chuck was developed because of the inability of ordinary production lathes to carry such a piece supported on the end of the lathe spindle.

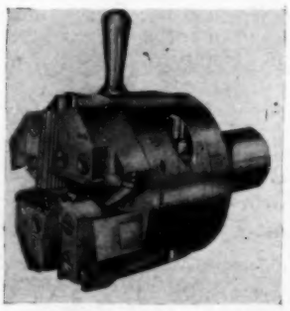
The feet of the chuck are clamped against the column of the vertical lathe and the revolving member is attached to the table. An attachment is incorporated for varying the relation between the two axes of the ellipse. The faceplate is 16½x21 inches.

— 86 —

Diehead, "Landmatic," Type F

Landis Machine Co., Waynesboro, Pa. [Vol.70,p.679]

For application to turret lathes and hand-operated screw machines, the type F Landmatic was developed to meet the demand for a diehead to produce full and accurate threads when the stock is slightly bent, when the turret and spindle are out of line, and when the gripping mechanism grips the stock off-center. The head floats or flexes on the shank. It is thus free to center itself around the center of the stock and produce a full thread. Flexibility is controlled by two heavy springs, which return the head to the central position when it is not necessary for it to be off center. The locking mechanism is en-



tirely independent of the shank and floats with the head proper. The driving torque is transmitted directly from the shank to the head body, and is also independent of the rest of the head. The head is opened automatically by retarding the forward motion of the carriage, and is closed by hand.

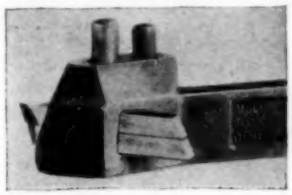
The chasers are supported on the face of the head to give maximum chip clearance and convenient access when it is necessary to remove them for grinding.

— 87 —

Toolholder, Multiple-Bit

Wedge-Lock Tool Co., 549 W. Randolph St., Chicago, Ill. [Vol.70,p.837]

Both right- and left-hand offset types of a multiple-bit toolholder have been placed on the market. Two types of tool slots are provided, square in all sizes from ¼ in. and up, and rectangular from ¼ to ½ in. and up. The tool bits are secured



in the holder by a wedge-locking device. If a tool is tipped with tungsten carbide, a filler piece can be used that takes the downward strain on the cutting edge. It is not necessary to back the compound rest to withdraw the tool bit from the work in order to change bits.

There are two round pins extending out at the top of the holder. Locking is accomplished by tapping the forward pin lightly, thus driving the front wedge down into contact on one side of the bit. Releasing the tool bit is done by striking the second pin, thus releasing the second wedge.

— 88 —

Lathe Dog

Peacock & Son, 913 Collings Ave., West Collingswood, N. J. [Vol.70,p.914]

This lathe dog is designed upon the cam grip principle, by which the cam pressure becomes greater as the force applied to the part held is increased. The dog proper is an elliptical-shaped steel casting with a boss at one end and a driving arm on the other. The driving arm engages an angle or pin on the

faceplate and the resistance against the cutting tool determines the grip of the cam on the piece being cut. The dogs are made in ten sizes, 1½ and 2 in., and in increments of an inch up to and including the 14-in. size.

— 89 —

Lathe Attachment, Automatic "Work Driver"

Seneca Falls Machine Co., Seneca Falls, N. Y. [Vol.70,p.917]

This automatic "Work Driver" has been supplied for the past two years only to users of "Lo-swing" lathes, but is now being offered for general sale. The chief feature of this patented device is that it eliminates the necessity of dogging work. The driver may be applied to any machine by the use of a chuck plate similar to that used in applying standard chucks to lathes.

The work is gripped by means

of two corrugated jaws, the corrugated surface being somewhat eccentric to the pivoting point. These jaws are mounted in a slide which is free to float in a transverse guide in the driving head, so that, regardless of whether or not the work is properly centered, there is no danger of putting excessive pressure on the head center.

— 90 —

Tool, Cutting-Off, Spring-Type

Armstrong Bros. Tool Co., 315 N. Francisco Ave., Chicago, Ill. [Vol.70,p.1031]

This spring-type, straight-shank, cutting-off tool has a drop-forged body and the tool-bit is held in position by a set-screw which permits any desired clearance. The goose-neck form

of the shank gives a resiliency that takes up any chatter and keeps the work from climbing up on the tool.

Milling Machines

— 91 —

Milling Machine with Hand and Power Feed

Kent-Owens Machine Co., 958 Wall St., Toledo, Ohio. [Vol. 70,p.375]

High spindle speeds necessary for small diameter cutters and for milling aluminum, brass, and other soft materials, as well as for the use of Carboloy and similar tools, are featured in this combination hand and power feed milling machine. The spindle is mounted on Timken roller bearings, thus permitting speeds up to 2,000 r.p.m. The spindle driving pulley is of the balanced, flywheel type to eliminate chatter. A combination manual and power feed arrangement is featured. In either case, the quick return is by hand.

The table has a working surface 28 in. long and 7 in. wide, and is carried on a column having deep sections. A special table 50 in. long can be supplied. Maximum distance from the table to the spindle is 17½ in. Vertical feed of the head by hand lever is 6½ in., and the cross-channel feed is 7 in. Six feed changes are available, and change gears may be mounted to obtain additional feeds. The spindle is supplied with the new standard taper and has a ¾-in. clearance hole throughout.

Drive may be either by belt or a 5-hp. motor. Floor space 61x74 in.; weight 2,600 pounds.

— 92 —

Milling Machines, Vertical Reciprocating and Rotary Table Types, "Rigidmil"

Sundstrand Machine Tool Co., Rockford, Ill. [Vol.70,p. 490]

Extension of the standard line of No. 3 "Rigidmil" milling machines has been made by the recent development of an improved rotary table and an improved vertical spindle head, both of which may be placed on the standard bed and column. An earlier form of the rotary

table and of a vertical spindle head attachment were described on page 686, Vol. 64, of the *American Machinist*.

Base, column and saddle of the No. 3 Rigidmil are combined in one casting. The vertical spindle head is mounted on the column in place of the horizontal head described on page 501, Vol. 61, of the *American Machinist*. Driving power for the vertical cutter spindle comes from a shaft which drives the horizontal head, is transmitted to a horizoztnal shaft, and thence to a pair of pick-off gears, and finally through a worm and wormwheel combination to the spindle, which is of the National Standard type. Vertical adjustment of the spindle is 10½ in. Standard spindle speeds range from 12 to 648 r.p.m. for both the reciprocating and the rotary types, but with the addition of the pick-off gears mentioned above a speed range from 9 to 925 r.p.m. is available.

Reciprocating tables are available in 28-, 34 and 42-in. feeds and a special feed of 60 in. The standard working surface is 14½x50 in. with a feed of 28 in. The rapid traverse is at the rate of 102 in. per min. Table feeds range from 1.9 to 21.4 inches.

The rotary table is mounted directly on the saddle without intervening sliding members. The rotating portion is 17 in. in diam. The table is driven by a worm. Fixtures up to 22 in. in diam. may be used. Timken roller bearings are used on the vertical spindle head. Motors from 5 to 7½ hp. are required for either type of milling machine. The total height is 58 in. in both cases.

Weight of the vertical reciprocating machine is 4,600 lb.; rotary machine, 4,500 pounds.

— 93 —

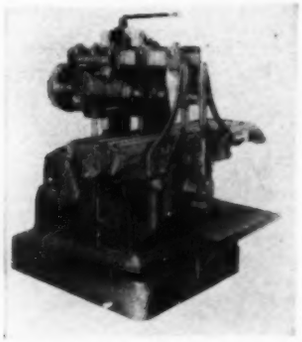
Milling Machine, No. 30, "Rigidmil"

Sundstrand Machine Tool Co., Rockford, Ill. [Vol. 70, p. 1024]

Either hydraulic or mechanical feed mechanisms can be obtained on this machine. The hydraulic feed permits any desired rate between 0 and 50 in. per min. and embodies a rapid traverse at 103 in. per min. The mechanical feed has three pairs of pick-off gears for six feeds

from 1.49 in. to 22 in. per min. The tables have a working surface of 14½x50 in. standard, and 14½x70 in. special. The standard table feeds are 20 in. for the hydraulic and 32 in. for the mechanical, and 30 in. for the hydraulic and 50 in. for the special mechanical mechanisms.

Hydraulic feed is obtained by means of an Oilgear pump mounted in the base. Automatic table control is governed by two stop blocks with nine dogs located between them, all adjustable. The blocks will cause the table feed to throw out within



plus or minus 0.002 in. of a selected point.

The base-column-saddle casting is made in one piece. The spindle-head carries a forged steel spindle suspended in Timken roller bearings front and rear and having a National Standard nose with 2¾-in. hole at the large end and 3½ in. taper per foot. The entire spindle assembly is carried in a steel quill, hardened and ground, and having a 4-in. traverse. Smooth spindle drive is obtained through a coarse-pitch spiral bevel pinion and gear. A fly-wheel aids in preventing vibration. The construction of the overarm permits special cutter heads.

Drive is obtained by a motor at the base only, a 5-hp., 1,200-r.p.m. type being standard. A vertical spindle-head and rotary table for the No. 30 are available.

Specifications: Vertical adjustment of spindle, 10¾ in. for both sizes; horizontal adjustment of spindle, 3 in.; distance center of spindle to underside of overarm, 6½ in.; maximum distance center of spindle to table, 13⅜ in., minimum, 2⅜ in.; maximum distance spindle face to outer edge of table, 14⅜., minimum, 11⅜ in.; spindle speeds, 30 to 278 r.p.m.; table height, 35 in.; total weight, 5,100 pounds.

— 94 —

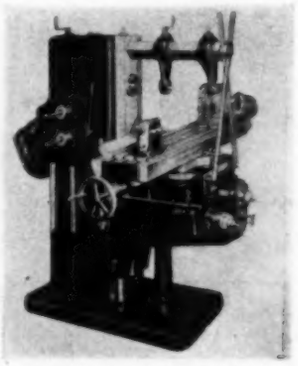
Milling Machines, Plain and Universal

Shields Machine Tool Co., Inc., 407 West St., New York, N. Y. [Vol.70,p.71]

Four sizes of plain and universal milling machines are being manufactured. The plain milling machine is built primarily for production work, and at the same time has sufficient flexibility to meet the requirements of the toolroom. It is provided with the standardized spindle nose, power feeds in all directions, spindle reverse, automatic cutter coolant system, plain vise, and other accessories. Clutch, spindle, and friction feed drives are adjusted from the outside.

Among the improved features is the use of chrome-nickel, semi-steel castings. Each shaft is mounted on ball bearings, and all shafts are of alloy steel. All gears are casehardened. The column knee and saddle mechanism run in oil baths, and the gear shifts are made by selective sliding gears. Eight speeds forward and eight feeds forward and reverse in geometrical progression are provided. The machine may be stopped and started from both sides.

Specifications No. 1, heavy-type. Range, longitudinal, 22



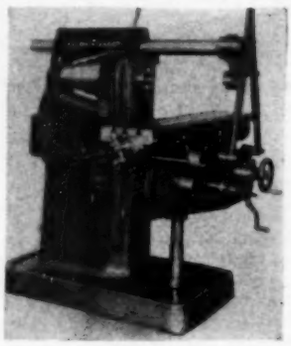
in., transverse, 8 in., vertical, 18 in.; table surface, 11x48 in.; capacity, column face to braces, 23 in.; floor space, 5 ft. 4 in. by 7 ft. Specifications No. 4, standard model: Range, longitudinal, 4 in., transverse, 14 in., vertical, 19 in.; table surface, 15x59 in.; capacity, column to braces, 32½ in.; floor space, 7 ft. 7 in. by 10 ft. 4 in. Power required varies from 27½ hp., and the weight varies from 3,100 to 6,800 pounds.

— 95 —

Milling Machines, Plain and Universal, "Standard," No. 2

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.681]

A No. 2 universal and a No. 2 plain milling machine have been added to the "Standard" line of milling machines. They are similar in many ways to the No. 1 machine described on page 369, Vol. 69, of the *American Machinist*, but they are of the cone-drive type, and as such are particularly suited for toolroom installation and for light manufacturing. Fast and slow series of spindle speeds are available, with the slow series obtained through back-



gears. Operating positions are provided at the front and rear of the table. The rate of feed engaged is shown on both of the direct-reading dials.

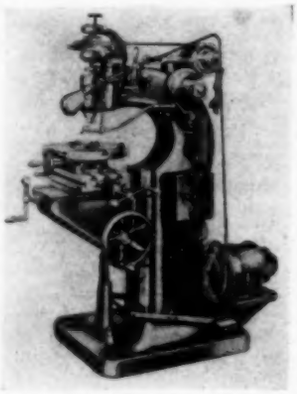
The one-piece, knee-elevating screw assures accuracy. It is completely inclosed in a steel sleeve and does not extend below the base of the machine. The overarm is firmly clamped at two points by a single lever. Filtered oil is provided automatically to all bearings within the column.

— 96 —

Milling Machine, Vertical, No. 2

Reed-Prentice Corporation, Worcester, Mass. [Vol.70,p.873]

The No. 2 Becker type die-sinking and vertical milling machine is driven by a constant-speed motor, adjustable-speed



motor, or by countershaft. Flat or round canvas belting may be employed from the motor pulleys. Spindle speeds up to 6,000 r.p.m. are available. The spindle is provided with double auxiliary supports having ball bearings, thus preventing belt pull on the spindle. Column and knee are studily built and the saddle extends the full length of the table, as in all Becker machines, and forms a rigid support. Cross, vertical, and longitudinal feed screws are provided with micrometer collars for accurate control. Control of the cutter is provided by the sliding head operated by a treadle or clutch-type handle. A micrometer stop is furnished for the head feed.

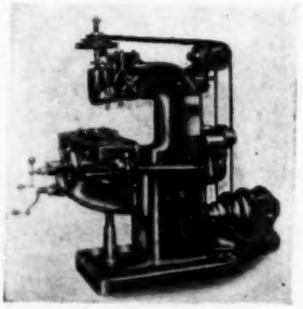
Specifications for the No. 2 Becker machine are as follows: Longitudinal feed, 14 in.; cross feed, 11 in.; vertical feed of knee, 15 in.; head travel, 2 in.; maximum distance between spindle and machine table, 17 in.; maximum distance between spindle and rotary table, 13 in.; maximum distance between spindle and frame, 15 in.; working surface of machine table, 18x⅞ in.; working surface of rotary table, 15 in.; floor space, 54x57 in.; weight without the rotary table is 1,775 pounds.

— 97 —

Milling Machine, Vertical, No. 3

Reed-Prentice Corporation, Worcester, Mass. [Vol.70,p.873]

With regard to construction of the Model 3 die-sinking, vertical milling machine, the knee is of the rigid, full box form to prevent vibration. Spindle speeds to meet average conditions are furnished from 5½- to 10-in. spindle drive pulleys. Both longitudinal and cross feed screws are arranged with micrometer stops. The power for longitudinal feed to the table is obtained through a cone pul-



ley and a sliding gearbox, which has hardened steel gears. The machine has six different speeds; a rotary attachment with power feed adds to the range. The machine is equipped with both hand and power feed in all directions.

Specifications for the No. 3 unit are as follows: Longitudinal feed by power, 21 in.; cross feed, 12 in.; vertical feed at knee, 17 in.; head travel, 3½ in.; maximum distance between spindle and table, 16½ in.; maximum distance between spindle and rotary table, 12 in.; maximum distance between spindle and frame, 16 in.; rotary table working surface, 13 in.; machine table working surface, 10¼x30¾ in.; longitudinal feed per revolution of spindle, 0.0037 inch. Spindle speeds range from 95 to 1,225 r.p.m., the standard range.

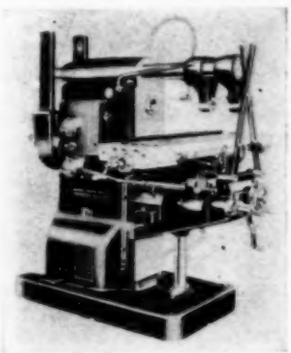
Floor space, 73x68 in.; weight without rotary table 2,400 lb. Constant-speed or adjustable-speed motor drive may be obtained at the option of the purchaser.

— 98 —

Milling Machines, No. 4A Universal and No. 4B Standard

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.875]

Regular constructional and operating features of the line of "Standard" milling machines previously described on page 35, Vol. 68, and on page 369, Vol. 69, of the *American Machinist*, are available in these largest of the "Standard" machines, No. 4A universal and No. 4B plain millers. The machines are all gear driven, with anti-friction bearings on driving pulley and spindle, and in the feed and



power fast travel mechanisms. Two operating positions are provided, one at the front and one at the rear of the table. The rates for feed and speed for which the machine is set are indicated by dials. The machines are equipped with power fast travel for longitudinal, transverse, and vertical movements.

One of the important features of the No. 4B standard machine is the automatic disengagement of the power fast travel with simultaneous engagement of the cutting feed without any attention from the operator. Automatic lubrication with filtered oil is provided for all mechanisms within the column. Automatic oiling is also provided for the knee assembly by a separate pump.

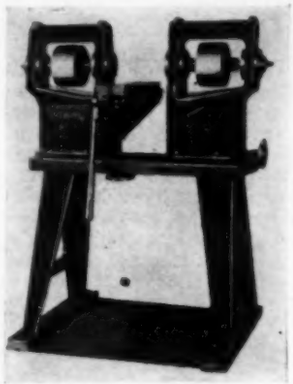
The machines are available as belt-driven, fitted for motor, or equipped with motor.

— 99 —

Milling Machine, Hand, Duplex, No. 2

Frew Machine Co., 124 W. Venango St., Philadelphia, Pa. [Vol. 70,p.490]

Milling parallel faces on opposite sides of the work with hand feed is possible on this No. 2 unit. The machine is particularly adapted for economical and rapid manufacturing of small standard articles. The model illustrated is equipped for single pulley drive and can



also be furnished with cone pulleys.

One column is stationary and the other is movable. The stationary column carries the knee, saddle, and table. The last having an area of 16¾x4¾ in. is moved by means of a hand lever through 4 in. In and out movement of the table is by means of a screw. The vertical movement of the knee is by means of a handwheel, but lever feed to the knee can also be furnished. The movable column is adjusted by means of a handwheel at the end of the bed. Adjustment in line with the spindle is 1⅞ inches.

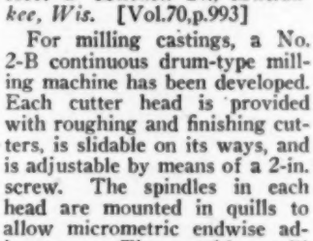
The spindles are of alloy steel, and are carried in Timken roller bearings. The minimum distance between the spindle ends is 6¾ in., the maximum being 10 in. Height from the floor to the spindle center is 42½ in. Floor space, 36x20 inches.

— 100 —

Milling Machine, Continuous, Drum-Type, No. 2-B

Davis & Thompson Co., 57th Ave. & Mitchell St., Milwaukee, Wis. [Vol.70,p.993]

For milling castings, a No. 2-B continuous drum-type milling machine has been developed. Each cutter head is provided with roughing and finishing cutters, is slidable on its ways, and is adjustable by means of a 2-in. screw. The spindles in each head are mounted in quills to allow micrometric endwise adjustment. The machine will



take 42-in. between cutters and the heads can be placed as close together as desired.

The work mandrel is 10 in. in diam., and the driving gears in the head are 16 in. in pitch diam. and have 6 in. face. The work drum is started and stopped by a clutch operated from the left-hand end of the machine. Pick-off gears govern the amount of feed. The work-drum or fixture is made in halves and clamps on the work mandrel in the same manner as a split coupling is clamped about a shaft. The distance between the mandrel and the cutter spindle is 20 in. The machine is designed to take the company's patented chain clamping equipment.

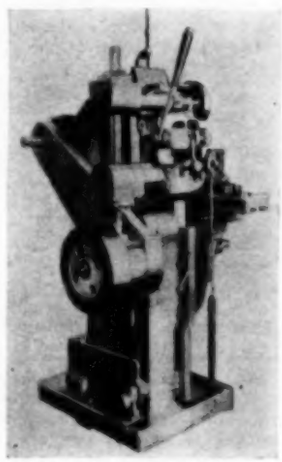
Weight, 25,000 pounds.

— 101 —

Milling Machine, Opposed-Feed, Double-Spindle

Kent-Owens Machine Co., 958 Wall St., Toledo, Ohio. [Vol. 70,p.679]

Intended especially for piston slitting and similar operations, the No. 1, double-spindle, opposed-feed milling machine has been placed on the market. Both slots are milled in the skirts of aluminum pistons at a rate between 600 to 1,000 pieces per hour, dependent on the size. The fixture is entirely automatic except for placing and removing the work. Both spindles and



the backshaft are mounted on Timken tapered roller bearings. A flywheel-type pulley and a sturdy box section frame insure smooth operation.

Working surface of the table is 22x5 in. The distance between spindles is 4¾ in., minimum, and 12½ in. maximum. Horizontal table feed is 4 in. by lever, 17 in. by crank. Cross saddle feed is 5 inches.

The spindles are heat-treated and ground. They are driven through a silent chain to a splined shaft carrying hardened alloy steel bevel gears mounted on ball bearings. The cone pulley has two steps and the backshaft is mounted on Timken taper roller bearings, front and rear. If motor drive is desired, a 3- to 5-hp. unit is recommended.

Floor space 34x48¾ in. Weight 1,400 pounds.

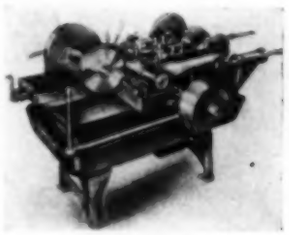
— 102 —

Milling Machine, Cam, Automatic

Producto Machine Co., Bridgeport, Conn. [Vol.70,p.879]

Two different sized cams for radial aircraft engines can be milled simultaneously on this two-spindle automatic cam miller. In the machine illustrated, the cam being cut has eight lobes, four on each side, equally spaced, and separated by a groove. The cams reach the machine roughly forged to shape and are finished at the rate of 5 to 6 pieces per hour.

In principle of construction, the machine consists of a fixed work spindle carrying the cam, a fixed spindle carrying the two master cams of the same contour as desired on the work, and two cutter heads sliding on dove-tailed ways. The movement of the cutter heads is controlled independently by follower rollers bearing against the master cams under spring pressure. These rollers are of the same



diameter as the milling cutters so that the exact size and shape of the master is reproduced on the work. A feature of the machine is that either ball or roller bearings are used wherever feasible.

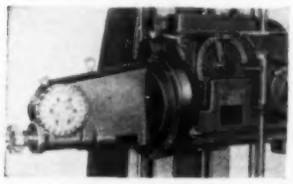
Drive is by a single pulley. Hardened steel helical gears transmit the power from the main drive shaft to two fixed worm shafts which engage corresponding worm wheels on each cutting spindle. Provision in the sliding head is made for shifting the cutter spindle to the opposite end so that it will cut a master cam. Cast integral with the base of the machine is an apron and coolant sump holding about 20 gal. Floor space 45x70 in.; weight 4,200 lb. net.

— 103 —

Milling Head, Side and End

Giddings & Lewis Machine Tool Co., Fond-du-Lac, Wis. [Vol.70,p.684]

Designed for the Nos. 45 and 50, high-power, precision, horizontal boring, drilling, and milling machine, this head is useful for the milling of such work as the slideways and bolster plate surfaces of punch press frames. The head unit is made in two sizes, 10 and 12 in., bearing large



cutters of corresponding diameters. The small cutters on each are 5 and 6 in. diam., respectively. The reach is 27 and 32 in., respectively.

Power for driving the cutters is received from the boring machine spindle. The speed of the large cutter is always one-fourth of the speed of the small cutter. All the bearings in the attachment are of the heavy, combination radial and thrust ball type. These, together with the worm, are packed in grease and completely inclosed. The attachment is bolted and doweled directly to the head of the machine in place of the backgear cover plate.

— 104 —

Milling Attachment for Hand Milling Machine, Vertical, Two-Spindle

Superior Machine & Engineering Co., 1930 Ferry Park, Detroit, Mich. [Vol.70,p.758]

Two vertical spindles are mounted on Timken roller bearings and are provided with spring chucks and draw-in bolts so that straight-shank end mills can be used. The main spindle

head, which carries the vertical spindle, has a vertical travel on the column of 4½ in. In addition, 6 in. longitudinal travel of the table, traverse travel of 6 in., and vertical travel of 12 in. are available.

The main spindle head is guided close to the cutter by means of a long narrow way, and a taper gib is provided so that wear can be readily taken up. The machine can be provided with either belt or motor drive.

Weight 1,000 lb., approximately.

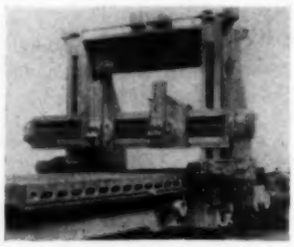
Planers

— 105 —

Planer, "Hypro," 96x96-Inch

Cincinnati Planer Co., Cincinnati, Ohio. [Vol.70,p.874]

All the standard features of the line have been embodied in the 96x96-in. "Hypro" planer. A harp clamp has been added to the saddles in order to prevent the harp pulling away from the



saddle when the slide and tools are extended below the bottom of the rail. Electric rail clamps have also been supplied. The standard tumbler mechanism has been simplified and connected to the master switch. A parallel drive box has been placed on the right-hand side of the housing to conserve floor space.

— 106 —

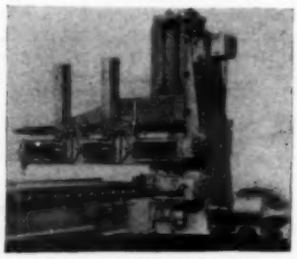
Planer, "Hypro," Openside, 96-Inch, Special

Cincinnati Planer Co., Cincinnati, Ohio. [Vol.70,p.913]

Especially designed for machining safe doors and frames, this special openside "Hypro" planer to take 96 in. is equipped with a special long steel slide which enables a reach of 40 in. below the bottom of the rail. This head is equipped with two means of holding the tools. One is by the regular clapper box and tool block, and the other is by means of a hole in the bottom of the slide to take a bar in which the tools can be mounted.

A special rail to support the top of the saddle has been applied. This gives the rail a third way and the saddle rides on this by means of roller bearings. A narrow guide is also provided to prevent all twisting moments. The standard feed and rapid traverse is supplied to the heads and the hand feed is operated through a special square. The harp carrying the slide is bolted through to assist the operator in swiveling the head. Rack teeth cut in the harp meshing with a pinion permit use of same crank for moving and swiveling head.

A supplementary rolling table



is supplied so that when machining doors up to 10 ft. square, the extreme overhang is supported by means of this unit. A torque motor is supplied for clamping the rail.

Presses

— 107 —

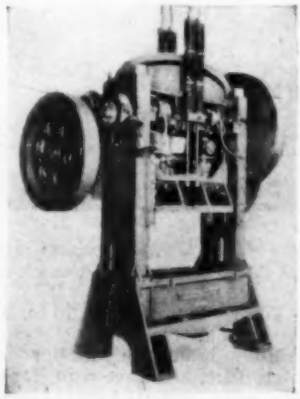
Presses, Tie-Rod, Straight-Side

Long & Allstatter Co., Hamilton, Ohio. [Vol.70,p.909]

Four sizes, known as the Nos. 5-, 6-, 7-, and 8-D in various widths between the uprights, are available. These presses have a self-adjusting friction brake with large diameter drum, a spring balance for the ram on machines with jaw clutches, and steel gear covers. The lower parts of the connections are of the knuckle type. The main members are made of semi-steel castings. Roller bearings are used in the flywheel shaft.

The clutch has hardened tool-steel striking and backing inserts. The clutch slides and drives on the square part of the crankshaft and has four striking surfaces. It is operated from a treadle through an improved mechanism guaranteed to prevent locking of the jaws while running idle.

Die space dimensions of the four presses can be changed to suit requirements. Standard strokes range from 3 to 6 in.; adjustment of slide from 3½ to 4 in.; maximum stroke, 6 to 12 in.; number of strokes per min. from 37 to 14 for single-geared types and from 23 to 12 for double-geared types; standard die space from top of bolster to bottom of slide, stroke down, adjustment up, from 8 to 17½ in., widths between uprights from 37 to 97 in. for the smallest size, and from 61 to 121 in. for the largest size. Weights range from 13,702 to 120,000 pounds.

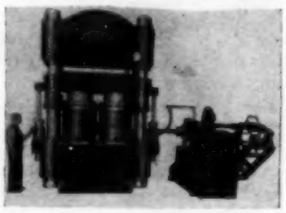


— 108 —

Press, Embossing, Hydraulic, 1,000-Ton "H-P-M"

Hydraulic Press Manufacturing Co., 20 E. Broad St., Columbus, Ohio. [Vol.70,p.566]

Automatic controls regulate the operation of this 1,000-ton hydraulic embossing press, these being embodied in the two-stage generator shown at the right. They cause the platen to move up at the rapid rate and then shift to the slower pressing speed. The pressure is next built up to a pre-determined maxi-



mum, which is held for a definite time limit, after which the pressure is released and the platen reversed at the rapid rate to the open position. The platens are 58x28 in., and a maximum stroke of 8 in. may be had.

By means of the control valve on the generator, the following may be obtained: Automatic pressure regulation; adjustable working pressure; variable stroke; adjustable opening; variable timing of the operating cycle, and close feed regulation. Presses having capacities ranging from 250 to 2,000 tons or more can be built.

— 109 —

Clutch, Press, Double-Pawl, "Canco"

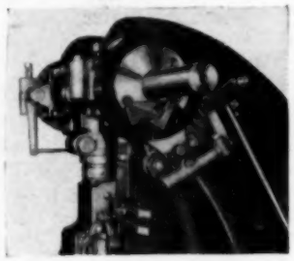
Equipment Division, American Can Co., 120 Broadway, New York, N. Y. [Vol.70,p.494]

Another feature of the line of "Canco" presses is the addition of a double-pawl clutch, which can be used in place of the present single-pawl clutch. The line of presses was described on page 1021, Vol. 68, of the *American Machinist*.

In addition to the present striking pawl, there is a locking pawl, working in the

opposite direction, that eliminates rebounding of the press slide at the bottom of the stroke, since this second pawl prevents the crankshaft from overtaking the flywheel. The double-pawl type is particularly recommended for deep drawing work, as in its operation the flywheel is securely locked to the clutch collar until the stroke is completed.

The disengagement of the locking pawl is positive and it is returned to its free position by



the clutch pawl itself, when the latter is cammed out of driving position by the trip. A locking arrangement is provided on this trip so that the treadle cannot engage the latch when a workman is setting dies or working under the punch.

The locking pawl, like other members of the clutch, is of tool steel, hardened and ground. The clutch has been adopted as standard equipment on all of the Canco OBI presses and can readily be used where necessary on the horn presses.

— 110 —

Clutch Control Mechanism, Non-Repeat, for Punch Presses

Federal Press Co., Elkhart, Ind. [Vol.70,p.993]

Power presses sold by the above company may now be furnished with a non-repeating clutch control mechanism. This equipment will function and stop the ram action after one stroke, even if the trip pedal is held down, and it requires the full

release of the trip pedal before the ram will function again. The mechanism is disengaged by slipping the sliding joint forward.

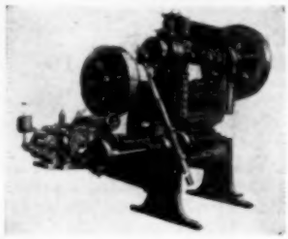
The non-repeat mechanism has the slide joints set ahead of the floating pins in the trip bar, allowing continuous operation of the press. It has a cam on the clutch flange of the crankshaft, and this cam operates the rocker arm and floating pin in the trip bar.

— 111 —

Feed, Punch-Press, No. 5

F. J. Littell Machine Co., 4125 Ravenswood Ave., Chicago, Ill. [Vol.70,p.610]

Coil stock up to ½ in. thick and 8 in. wide can be straightened and flattened, oiled on both sides, cut into the desired lengths up to 36 in., and a large number



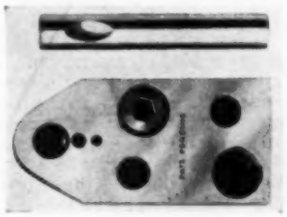
of holes punched in each piece. The hardened and ground feed rolls are 5½ in. in diam. by 8½ in. wide, and can be made wider if desired. The driving mechanism is made of tool steel, hardened and ground. A speed of 35 to 50 r.p.m. can be maintained. When operating at about 35 strokes per min., the machine will deliver approximately 15,000 pieces in a 9-hour shift. The feed is mounted on a large and heavy semi-steel bracket attached to the side of the machine.

— 112 —

Punches and Punch Retainers, Interchangeable

King Works, 7350 St. Aubin St., Detroit, Mich. [Vol.70, p.683]

A complete line of interchangeable punches and punch retainers embodying improved features, which can be incorporated into any piercing die, whether single or in gangs, has been brought out. A broken punch can be removed and a new one inserted without removing



the die from the press. An outstanding feature is the high factor of safety against stripping strains. Releasing of the punch is simple; the prop is pressed against by an extractor and the punch drops out.

It is a simple matter to line up the punch with the die hole, as the punch is flexible and can be moved up or down before it is locked in position by action of the prop. Punches and retainers are made in all sizes and shapes. Retainers are made in three distinct shapes that lend themselves to any grouping of holes.

— 114 —

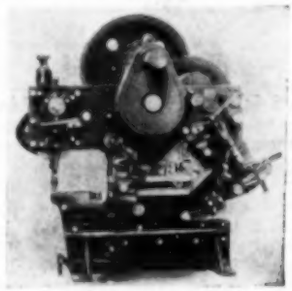
Punch, Shear, Angle and Bar Cutter, and Coper, Type ME-10

Henry Pels & Co., 90 West St., New York, N. Y. [Vol.70, p.916]

Punch and shear speeds of 40 strokes per min. are featured. This unit is the smallest of type ME machines yet developed, but in general it has all of the features and characteristics of sturdy construction as for the Nos. 13 and 16 units described on page 1022, Vol. 69, of the *American Machinist*. As in the larger machines, the frame is made of heavy rolled steel plate guaranteed to be unbreakable for the service intended. The flywheel runs in long bearings supplied with lubricant by ring oilers. All gears have cut teeth. Bronze bushings are used throughout.

Holes 1x⅜ in. or ¾x½ in. can be punched. The throat depth is 12 in., and the holes can be punched in flanges of 3- to 9-in. beams, and in the webs of 3- to 14-in. beams.

Slitting plates up to ⅜ in. thick in any width and length, together with shearing up to ½-in. plate can be done on the slitting shear. Several openings are provided for cutting round and square bars, the maximum square being 1⅜ in., and the max-



imum round, 1½ in. The angle cutter can also be arranged for cutting Ts. Angles or Ts can be cut off up to 3x3x⅜ in. on straight cuts, and on miter cuts up to 2½x2½x½ in. The coper will make rectangular slots 2 in. wide by 3⅜ in. deep in ½-in. stock. The machine requires 2½ hp. for belt drive and 3 hp. for direct drive.

Overall length, 55 in.; width 36 in., height 50 in.; weight 2,550 pounds.

Punching and Shearing Machines

— 113 —

Shear, Punch and Coper, Small

Joseph T. Ryerson & Son, Inc., Chicago, Ill. [Vol.70,p.73]

For the shop handling a varied class of work on the smaller steel sections, this machine is suitable for punching, plate and bar shearing, angle and T-cutting, angle and T-mitering, coping and notching. The punch has a deep throat, and is capable of handling most varieties of structural shapes having webs or flanges from ⅛ to ½ in. in

thickness. The shearing end of the machine is constructed so that a single slide may be used for shearing angles, bar cutting, plate shearing, and coping.

The angle shear attachment performs both inside and outside miter cutting, as well as straight shearing. The bar cutting blades, located directly below the angle shear blades, handle both round and square sections. Directly below the bar cutter are located the plate shearing blades, which will handle plates of any width or length, and up to ½ in. in thickness.

The coping device is built at the shear end of the machine, and is extended out from the frame. It is furnished regularly in the V-notch type, but the square-notching type can be provided.

The drive is taken from steel gears to alloy-steel eccentric shafts. The clutches are of the two-jaw type, giving the operator a chance to engage the clutch every half revolution of the clutch gear. The main frame of the machine consists of a one-piece alloy steel casting.

— 115 —

Shears, Alligator, Improved

Canton Foundry & Machine Co., Canton, Ohio. [Vol.70, p.413]

Cut steel gears and pinions have been incorporated in the all-steel "Canton" alligator shears, making the line quiet in operation and reducing wear on the bearings and on the shears.

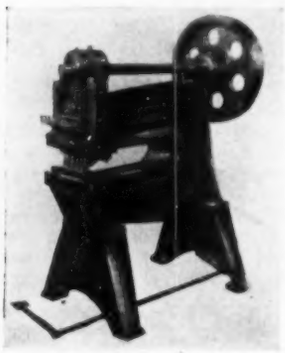
An adjustable gunmetal bearing is applied between the arm and the bed, its purpose being to take up all wear between the arm and housing and thus preserve alignment. The shears are available to cut from 2x2-up to 4½x4½-in. rounds and squares in soft steel and iron.

— 116 —

Punch Press and Nibbler, Selective Die, No. 4-4B

Zeh & Hahnemann Co., 182 Vanderpool St., Newark, N. J. [Vol.70,p.567]

Individual action of the six punches and dies on the No. 4-4B punch press and nibbler can be brought about by pressing the proper buttons. The standard punches and dies furnished are ¼, ⅝, ½, ⅜, and ⅛ in. in diam. A nibbling punch and die are



also furnished. Cutting speed is 36 in. per min. The machine permits cutting shapes and openings of any form as well as punching holes.

The punch is pedal controlled and stops automatically at the high point of the stroke. The throat is 24 in. deep, enabling punching of holes in the center of 48-in. sheet. The strippers are arranged to allow the use of a horseshoe system of gaging. Maximum capacity of the machine is a ¾-in. hole through 7/16-in. sheet steel. The machine can be furnished with a direct-connected 1-hp. motor if desired.

Weight is 2,500 lb. net.

— 117 —

Squaring Shear, All-Steel, 14-Gage

Dreis & Krump Manufacturing Co., 74th & Loomis Blvd., Chicago, Ill. [Vol.70,p.719]

Light and heavy types of this under-drive all-steel squaring shear are available. The lighter type shear differs from the heavier one with regard to the driving mechanism, having a two-shaft drive with positive quick-acting, jaw-type clutch, instead of a three-shaft drive with friction clutch, as in the heavier model.

When the treadle is fully depressed, the upper knife bar

makes one complete stroke and stops at the highest point, unless the treadle is held depressed, in which case the upper knife bar is kept in continuous motion. Provisions are made so that the clutch cannot engage unless the treadle is fully depressed.

These shears are of the steel-plate welded construction. In both types a "Super-Uniform" pressure hold-down is used, assuring a uniform amount of pressure on the metal before the cutting operation is started and also during the stroke. Complete guarding of the mechanism is used on the front, rear, and sides of the shear. Timken roller bearings are mounted in the flywheel shaft to insure ease of operation and saving of time. Standard equipment includes a centralized system of lubrication.

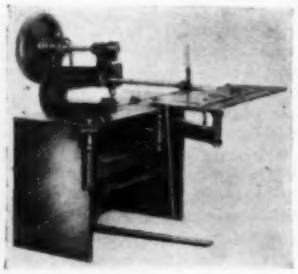
The light machine shown is primarily designed for cutting 14-gage sheet, in 3- to 12-ft. widths, and also shorter widths of 10-gage and 7/16-in. material.

— 118 —

Cutting and Piercing Machine, Metal, 12-Inch

S. A. Asquith & Son, 2514 Sunset Blvd., Los Angeles, Calif. [Vol.70,p.761]

Duplication of a pattern in sheet metal can be performed on this machine. Both the stylus bearing against the pattern and the punch cutting the work are stationary in a horizontal plane, while the pattern and the material are carried on a platen on frictionless supports free to



move in any direction in a horizontal plane.

Where a limited volume of production makes the use of profile punches and dies too costly, this machine can be used in place of the usual method of "hewing to a line" commonly employed. The punches and dies used on the machine are both capable of continuous resharpening, and when eventually worn out they are replaceable at a nominal cost.

The main punch frame, which is of semi-steel, has a throat depth of 12 in., and provides a working area of 12x48 in. without disturbing the work or pattern. Provision is made for the attachment of a high-speed wood or metal router, which can be driven from the same motor that is used for the punch reciprocation. The crankshaft and punch ram are made of chrome-vanadium steel, heat-treated and ground. A ½-hp. motor drives the unit.

— 119 —

Punch, Lever, Ball-Bearing, No. 19

Excelsior Tool & Machine Co., East St. Louis, Ill. [Vol. 70,p.759]

This lever punch is readily portable. The stand on which the unit is mounted has forward protruding legs, so that the ma-

chine will not tip over when punching the full capacity, and two wheels are attached to the back of the stand whereby the machine can be readily pushed to any location.

Ball bearings are used on the eccentric and main shafts, and it is claimed that a boy weighing 120 lb. can easily punch a ⅞-in. hole in 7/16-in. steel plate. The handle is counterweighted so that it will always return to an upright position. A tool steel bushing in the slide is furnished for a 7/16-in. punch shank, but by removing this bushing a ¾-in. punch shank can be substituted. The die holder is easily adjusted to suit the punch. Provision is made to take up wear on the slide, which is square, and gages are provided.

The throat depth is 6 in., and the die surface is 36 in. from the floor. Overall height, 51 in.; weight, 450 pounds.

— 120 —

Nibbler and Drill-Rod Cutter, No. A-5, "Handnib"

National Machine Tool Co., Racine, Wis. [Vol.70,p.916]

Cutting drill rod and both inside and outside nibbling can be done on the Model A-5 "Handnib" bench-type unit. This unit is similar in construction to that announced on page 754, Vol. 68, of the *American Machinist*. The device will cut a ⅜-in. drill rod without distortion. It is also suitable for cutting templets from sheet metal and for cutting trial blanks for metal

stamping work. Blades for inside and outside nibbling may be interchanged readily. The capacity is ⅛-in. flat stock and the depth of cut is 3 in. from any outside edge. The nibbling blade furnished is ¼ in. thick. The device may be mounted in a vise or on a bench as desired.

Threading Machines

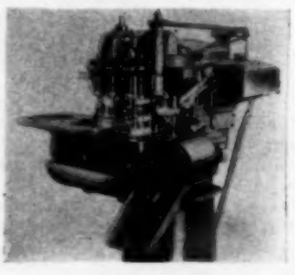
— 121 —

Tapping Machine, Automatic, "Mansaver"

J-B Engineering Sales Co., New Haven, Conn. [Vol.70,p.72]

Pieces as large as 12x8x6 in. can be automatically tapped at a rate varying from 20 to 80 pieces per min., in the "Mansaver" automatic tapping machine. In addition to tapping, the unit can be arranged to insert screws or rivets, upset screw threads, spin rivets after insertion, do light forming after tapping, and light drilling.

The essential elements are the adjustable tapping heads and the feeding mechanism. The maximum number of holes tapped in a single-head machine is eight,



but due to the method of feeding, this number may be increased by means of double- or triple-head machine. Holes can be tapped as closely on the Mansaver automatic tapper as can be tapped on a single-spindle machine.

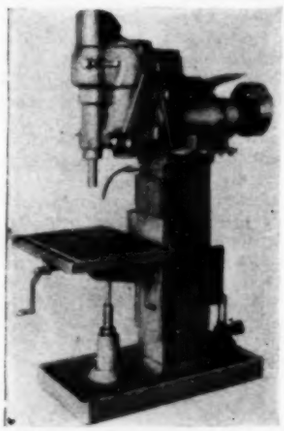
The tapping heads are driven by a reciprocating rack-and-pinion drive and intermediate steel spur gears. The spindles are positively driven, but are so arranged with a compensating head that the tap follows its own lead. Taps are held by standard chucks. All spindles are ball bearing equipped. Automatic feeding of parts to be tapped is arranged for. A screw driver head, as well as special upsetting heads, can be obtained. Cutting compounds can be supplied to the taps by a self-contained oil pump.

— 122 —

Tapper, Pneumatic, Heavy-Duty, No. 5

W. Gaterman Manufacturing Co., Franklin & 15th Sts., Manitowoc, Wis. [Vol.70,p.682]

Following the design and principle of the No. 10 heavy-duty tapper, this No. 5 model can be furnished in two ratios to the tap spindle. The first gives capacity for ¼- to ½-in. U.S.S. taps in steel, and the second, capacity for ½- to ¾-in. U.S.S. threads in steel. Spindle speeds are 425, 575, 750 and 1,000 r.p.m.



and 212, 285, 375, and 500 r.p.m. respectively. An improvement has been made on the method of spindle return in that a wide range of adjustable return torque can be had to take care of the various sizes of multiple heads.

A mechanism has been provided on the spindle to back it out automatically when it sticks. An air cylinder placed on top of the clutch spindle engages the clutches from reverse to forward only.

Transmission, forward and reverse gear, clutch and spindle assemblies are complete preassembled units inserted into the machine head. All of these assemblies may be removed for adjustment of repairs. Any ratio can be had between the clutch spindle and the tapping spindle by changing the gears. The spindle is carried on four tapered roller bearings. Machines are regularly furnished with hand lever speed to the tap spindle, but pneumatic spindle feed and a foot trip can be furnished extra. Lubrication of the machine is effected by means of both splash and force feed systems.

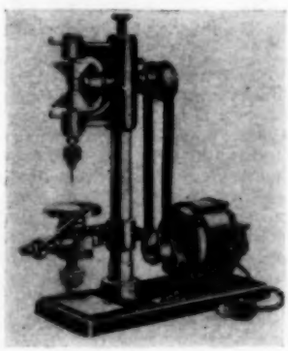
The No. 5 tapper will tap to a depth of 5 in. Important dimensions: Column to spindle, 10 in.; table dimensions, 19¾x24½ in.; vertical adjustment, 18 in.; overall dimensions, 34x26 in. Weight 1,000 lb. net.

— 123 —

Tapping Machine, Sensitive, No. 1

Adolph Muehlmatt, Lion Building, S.E. Cor. Fifth & Elm Sts., Cincinnati, Ohio [Vol.70, p.838]

Friction cone drive is employed on the spindle mechanism of this sensitive tapping machine, which will tap either right- or left-hand, blind or through holes up to ⅜ in. The



horizontal spindle carrying the cone driver is provided with a double set of ball thrust bearings. The entire head mechanism is completely shielded by means of a circular hood, thus protecting the operator from oil. This hood has been left off the machine shown.

Either a 4-in. round table or an 8x4½-in. rectangular table can be provided. The latter, known as the jig table, is furnished with each machine. The round table has a vertical movement of 1¼ in. For left-hand tapping, a cross belt may be employed or the rotation of the motor may be reversed. Both the horizontal and vertical spindles are of tool steel, hardened and ground.

Through three pulleys for ⅞-in. flat endless belts, a range of spindle speeds from 1,200 to 2,500 r.p.m. can be obtained. A ½-in. Jacobs chuck is provided. The base measures 16x7 in. The distance from the center of the table to the column is approximately 3¼ inches.

Overall height, 22 in.; weight, 60 pounds.

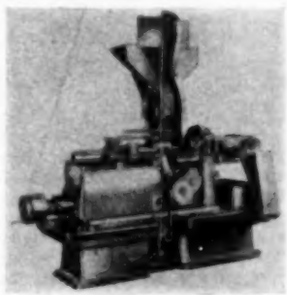
— 124 —

Threading Machine, Nut, "Threadnut"

Automatic Nut-Thread Corporation, 3617 North 8th St., Philadelphia, Pa. [Vol.70,p.220]

Hydraulic operation and capacity to tap from ⅞- to 1½-in. nuts with U.S.S. or S.A.E. threads are the chief features of the No. 3 "Threadnut" nut tapping machine. This machine is similar to that described on page 370, Vol. 67, of the *American Machinist*. It is fully automatic in operation. Production is 642, ⅞-in., or 366, 1½-in. U.S.S. nuts per hour.

A safety clutch throwout is provided so that, should any obstruction prevent the nuts from being fed onto the tap, the machine will be stopped automatically. After the obstruction has been removed, the clutch goes back into action automatically



so that the machine can be started by simply throwing the clutch lever in. The hopper is operated hydraulically and has a plunger feed.

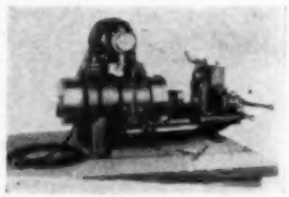
Bent-shank taps are used and are held in place in a floating position by a train of nuts on the shank. The coolant is fed through the plunger under pressure, and plays directly into the tapping jaws and onto the tap. The various speeds required are obtained through change gears, operated from controls at the end of the machine. Two sets of change gears control the speed of the feeding cam. One set is used for producing U.S.S. threads, and the other for S.A.E. threads. The machine is equipped with a forced-feed lubrication system. The spindle and back shaft are mounted on Timken roller bearings, all other bearings being equipped with double-row ball bearings.

— 125 —

Threading Machine, Portable, Universal No. 2

Peerless Machine Co., Racine, Wis. [Vol.70,p.185]

Pipe in sizes from ¼ to 2 in. can be cut off, chamfered, and threaded on this universal No. 2 machine, which uses any kind of square, solid dies or hand stocks. The motor operates direct from the light socket.



In addition to threading pipe, bolts from ¼ to 1 in. can be handled, and the machine will also drive geared stocks for cutting pipe from 2½ to 6 in. in diam. The shortest piece of pipe that can be cut is 5 in., and the shortest piece that can be threaded is 4 in. The machine is driven by a ½-hp. universal, variable-speed motor of the reversible type, operating on 115-volt, d.c., or 110-volt, a.c. circuits of 25 to 60 cycles. Because of the reversible feature, either right- or left-hand threads can be cut.

Length 29 in., width 9 in., height 21 in., weight 200 lb., net.

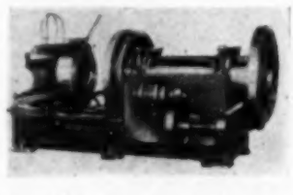
— 126 —

Threading Machine, Pipe, Duplex, No. 12

Bignall & Keeler Machine Works, of the N. O. Nelson Manufacturing Co., Edwardsville, Ill. [Vol.70,p.531]

Intended especially for oil field work, the No. 12 Duplex pipe threading machine has a 15½-in. bore through the arbor, which enables it to handle all sizes of pipe, casing, and tubing from 4 to 13⅜-in. A.P.I. casing, inclusive. The large bore gives ample room for oversize collars. Eight speed changes are provided. A two-way positive clutch is mounted on the bed shaft.

A three-jaw independent chuck is mounted at each end of the arbor. Either or both of these may be used for gripping the pipe for threading and cutting operations. The rear chuck is equipped with flange grippers



for making up and backing off flanged fittings. The carriage has a travel of 33 in. The "Peerless" sliding diehead can be arranged for dies of any desired width. Full length threads can be cut with these dies at one pass, the shape, taper, and pitch being accurate.

The heavy bed casting rests directly on the foundation and the lower half of the gearbox is a part of the shafting. Power is furnished by belts or a 7½-hp. motor. Cutting-off, beveling and reaming tools are regular equipment.

Weights: Belt-driven 12,000

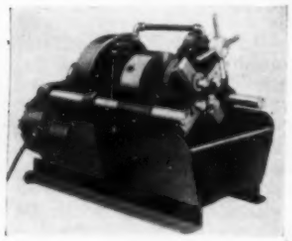
lb.; motor-driven 13,000 lb. Floor space, either model, 76x 125 inches.

— 127 —

Threading Machine, Pipe, Portable, No. 999

Toledo Pipe Threading Machine Co., Toledo, Ohio. [Vol. 70,p.1032]

This compact portable, bench-type machine will take from ⅛- to 2-in. pipe. It is fitted with a specially designed cutting



head with four knives cutting simultaneously. The dieheads are changed instantly from one size to another and the dies are easily reground when dull. The universal, reversible, ball-bearing motor operates from a lamp socket. An oil pump is built into the machine and is positive in action. Overload protection is afforded by a friction drive. The machine is sturdily constructed throughout and rests upon a set of heavy angles.

— 128 —

Slotting Attachment for Tapping Machine

Anderson Die Machine Co., Bridgeport, Conn. [Vol.70,p. 453]

This slotting or milling attachment has been developed for use with the dial tapper made by the above company. The milling spindle shown in

the foreground of the accompanying illustration is pivoted outside of the feeding dial proper, and is operated by means of a cam placed on the main vertical shaft of the machine so as to synchronize with the elements of the machine. This attachment is suitable for application to machines using dial plates, and also the unit illustrated on page 176, Vol. 69, of the *American Machinist*.

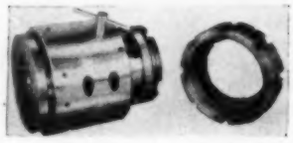
— 129 —

Diehead, Self-Opening Automatic, Type "CC"

Davis & Thompson Co., 57th Ave. & Mitchell St., Milwaukee, Wis. [Vol.70,p.953]

For use on the "Rotomatic" threading machine, an automatic self-opening diehead, which weighs 400 lb., and which is 18 in. in length, has been developed. Six of these dieheads are used on each machine, which has a capacity for threading pipe from 2 to 4 in. The closing mechanism on the head is taken care of by the operation of the machine. Changing the chasers is done easily.

The graduated dial near the



underside of the die is marked to show the position of the chasers, and the adjusting screws are located immediately adjacent to each side of this dial. Adjustment is obtained by means of a worm wheel with an eccentric pin on one end to operate the mechanism in feeding. The diehead is arrangd for an internal trip so that when the proper lengths of pipe are cut, the dies open automatically.

Welding Machines

— 130 —

Welders, Spot

Acme Electric Welder Co., Huntington Park, Los Angeles, Calif. [Vol.70,p.950]

Seven standard welders comprise this line of machines which are available in sizes from 7½ to 100 kw. These capacities are based on the output of the electrode at the highest tap on a conveniently located heat regulator. Intermediate

types for special purposes can be obtained.

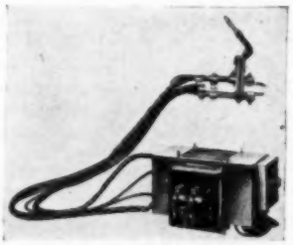
The transformers used are capable of 100 per cent overload of the rated capacity. In the larger sizes, they are supplied with a cooling device. Other features are: Numerous malleable iron parts; a hand-contact switch with easy thumb-pressure, make-and-break contact; an extra-heavy, toggle-type 360-deg. bonnet swivel head; a clamping device which holds the lower swivel in any desired position, and extra-heavy construction of the secondary, horns, horn holders, column, electrodes, and other copper conductors in order to insure maximum electrical conductivity.

— 131 —

Welder, Spot, Portable, 25-Kilowatt

Thomson Electric Welding Co., Lynn, Mass. [Vol.70,p. 955]

Designed for use in welding light sheet-metal parts which, because of their shape or overall dimensions, require the use



of a portable spot welder, this 25-kw. unit has been announced. It is particularly useful in welding operations on window frames, door frames, and automobile body parts. The welder consists of a 25- or 35-kw. transformer on which is mounted a magnetic wall switch and also a five-point regulator switch. The unit is also provided with four ears to permit its being suspended. Casters or small wheels may be fitted to the base.

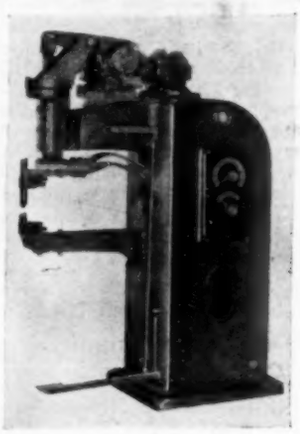
To the cast water-cooled terminals of the secondary, there are attached large extra-flexible cables, which terminate in a pair of hand-operated, water-cooled pliers. The design of these pliers is such that variously-shaped welding electrodes may be attached or removed quickly. Pressure on the welding points is obtained through a hand lever operating a rack and pinion. Pliers may be built with various throat depths. Control is through a push-button switch. The transformer is designed to give high secondary or welding voltage.

— 132 —

Drive Attachment, Power, for the Thomson Spot Welder

Thomson Electric Welding Co., Lynn, Mass. [Vol.70,p. 1029]

This power drive attachment is for application to the standard series of medium and heavy-duty spot welders manufactured by the above company. It is compact and consists of a 1-hp. motor connected through a three-speed Texrope drive to a gear reduction unit and camshaft carrying a suitable cam for obtaining movement of the upper electrode. A special adjustable split cam for controlling the current dwell and synchronized with the welding



cycle is supplied. The pressure on the welding electrodes is adjustable through a spring. A vertical adjustment of 12 or 24 in. is available on the lower horn and a special brace for this part, not shown, is applied for use when welding work which does not surround the lower horn.

Control of the attachment is obtained by a multiple-tooth clutch operated through a foot lever. A wide range of welding speeds for different classes of work may be obtained by the use of various speed motors and gear reduction units. With the addition of this attachment, the spot welders are suitable for either single spot welds on light or medium-weight stampings, or for projection welding of light stampings, and for multiple welds on wire goods articles. It may be attached to any standard welder having a throat depth of from 1 to 4 ft. and of 25- to 75-kva. transformer capacity.

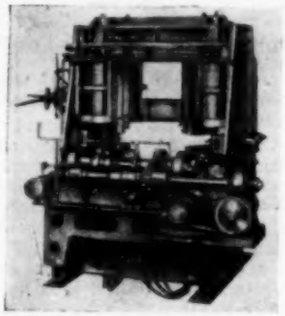
— 133 —

Welder, Cowl, Model 502

Thomson Electric Welding Co., Lynn, Mass. [Vol.70,p.721]

The Model 502 cowl welder is fabricated from heavy steel castings, structural plate and structural shapes. The four clamping cylinders are operated from a single Oilgear pump. Push-up pressure and movement are obtained from two direct-motor-driven cams having a cycle of 7 sec. The speed reduction between motor and camshaft is obtained by means of a "Texrope" drive and a standard gear reduction unit. Return of the movable platen to open or loading position is by means of two air cylinders.

The transformer is rated at



250 kva., and the current regulation is obtained through a separate auto-transformer. For clamping vertical flanges on the outer edges of the cowls, there are four small horizontal clamping cylinders. Special features have been provided for aligning and backing up the clamping dies.

Welders of this design can be adapted to various shapes of cowls, and, with minor changes can also be made suitable for butt-welding of wide, thin sheets up to approximately 44 in. in width.

Weight, 30,000 pounds.

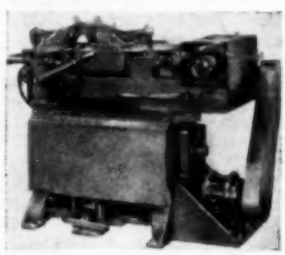
— 134 —

Welder, Miter, Power

Thomson Electric Welding Co., Lynn, Mass. [Vol.70,p.755]

Developed especially for making "T" welds or welds at an angle, this power-driven butt welder is particularly suitable for plants manufacturing window sash. The same machine may also be equipped with clamps for handling flat strip stock not over 4 in. in width, and for round or tubular members having a cross-section not exceeding ½ sq.inch.

Drive is by motor and belt to a worm reduction unit actuating a cam shaft. The work



clamps are air-operated and are controlled by a foot valve. The transformer is rated at 60 kva., and is completely protected from flash.

Various types of clamps for different classes of work may be supplied and can be arranged to operate in unison or independently. Similarly the return of the moving platen to open or loading position may be obtained either by hand or automatically. The welding speed or cycle may be varied from 10 to 20 cycles per min., depending upon the cross-section.

Weight, 3,000 to 3,500 lb., depending upon the clamp supplied.

— 135 —

Welder, Seam, 48-Inch Throat, Model 375

Thomson Electric Welding Co., Lynn, Mass. [Vol.70,p.836]

This unit is intended for welding containers or flat sheets to make a continuous wide strip. It is rated at 175 kva., and is air operated, and has automatic current control. The roller dies and terminal blocks are unusually heavy. A motor drives the upper roller or electrode, while the lower roller idles. Both upper and lower rolls are of large diameter and are water cooled. They may be quickly removed or replaced

when necessary. In addition, the lower roll unit is so mounted in the lower horn that the entire unit may be removed quickly and replaced by one of different design. The entire machine is sturdily built throughout and is designed for continuous operation.

Other Machines

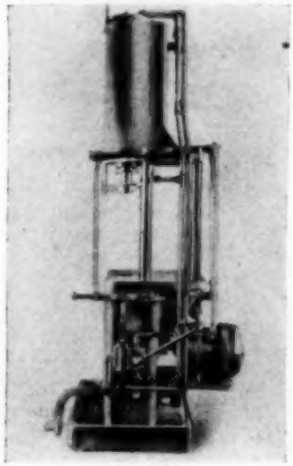
— 136 —

Broaching Machine, Hydraulic, 4-Ton, Type V-4

American Broach & Machine Co., Ann Arbor, Mich. [Vol. 70,p.760]

Straightening, assembly work, and broaching operations can be performed on this machine. It has 23 in. maximum space between the table and ram, and a 4-in. bore. A balanced piston valve can be supplied to give full pressure in either direction, or as a slip stem valve. With the latter valve the machine is suitable for straightening, as it gives flexible control and any pressure from zero to maximum by increasing the pressure on the treadle.

The machine has a work table 24 in. wide, fitted with a direct-reading gage registering in pounds and tons. The clear space in front of the tierods to the center of the ram is 4 in. The machine may be fitted with both treadle and hand lever con-



trol, and the ram returns automatically to the top of the stroke upon releasing the operating lever. The unit is driven by means of a 5-hp., 1,200 r.p.m. motor and the ram has a downward speed of 18 ft. per min., and a return speed of 24 ft. per min.

Floor space required, 4 ft. wide by 5 ft. deep; overall height, 10 ft.; weight, 3,000 pounds.

— 137 —

Broaching Machine, Hydraulic, Horizontal, No. 0

American Broach & Machine Co., Ann Arbor, Mich. [Vol. 70,p.35]

The No. 0 horizontal hydraulic broaching machine is intended to handle broaches up to 30 in. long, and is provided with

automatic stops for any desired stroke. The sliding head has a vertical adjustment of 1¼ in. either above or below center. The pulling ram is 1½ in. in diam., and the 5-in. bore in the face of the machine receives regular broach reducing bushings.

The machine has a capacity of 2 tons, and is for motor drive only. Ram movement is controlled by a balanced piston valve, with a relief valve in the pressure line, normally at 250 lb. per sq.in. The direct-reading gage shows the pressure applied.

The speed of the pulling ram is 18 ft. per min. with a pump speed at 600 r.p.m., but this can be changed to suit the work. A 2-hp. motor is recommended. A 5-gal. oil tank is built into the base.

Floor space, 4x9 ft.; weight, 1,400 pounds.

— 138 —

Bending Machine, Pipe, Nos. 6-C and 7-C

Wallace Supplies Manufacturing Co., 1310 Diversey Parkway, Chicago, Ill. [Vol.70,p. 836]

Standard bending forms are available on the No. 6-C machine for bending ½-in. pipe to a 7-in. radius up to 2½-in. pipe to a 15-in. radius. On the No. 7-C unit, which operates at a slower speed, there is a form for bending up to 3-in. pipe to a radius of 18 in., in addition to those for the No. 6-C. The motor inclosed in the base drives the machine through a

gear train with a worm and wheel as a final drive.

The motor is rated at 7½ hp. and on the No. 6-C the speed is 2 r.p.m., and when operating through backgears, 1½ r.p.m. It is possible to increase these speeds. In the No. 7-C, the speed with direct drive is 1½ r.p.m., and through backgears, 1 r.p.m. Both machines can be operated in forward or reverse and they can be made to stop at any point.

Dimensions, No. 6-C, floor space 5ft. by 5 ft. 6 in.; height overall, 42 in.; weight, 4,500 lb. Weight of No. 7-C, 4,800 pounds.

— 139 —

Bending Machine, Pipe, Improved

J. C. Higgins Manufacturing Co., 2228 Kettner Blvd., San Diego, Calif. [Vol.70,p.1029]

This machine will make 90 and 45 deg. bends and return bends, offsets of any size, coils, zig-zags, and under-and-over bends in pipe. The bends can be located anywhere in the length of the pipe, which is bent cold with nothing inside. One-quarter inch and ⅜-in. pipe are bent on a 2½ in. radius; ½-in. pipe on 2⅞ in. radius, ¾-in. pipe on 4 in. radius, 1-in. pipe on 5½ and 7 in. radii. The machine will also handle extra-heavy pipe and electric conduit. It

operates by hand power and is adjusted without extra tools.

The machine comes ready for bolting to the bench and is equipped with a right-and-left tilting table, three-point stop, and right-and-left hinged vise. It will operate in several positions and in cramped space. The bench space occupied is 10½ by 16 in. Weight, 230 pounds.

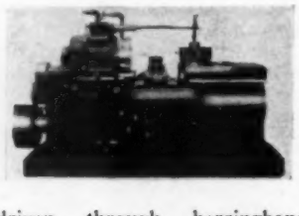
— 140 —

Chucking and Turning Machine, Automatic, No. 4-D

Potter & Johnston Machine Co., Pawtucket, R. I. [Vol.70, p.489]

Based on the design of the No. 5-A model, the 4-D automatic chucking and turning machine has heavy-duty shafts and gears made of chrome-nickel steel alloy, and wide turret slides and bed ways, each provided with hardened and ground steel inserts. All principal points in the base are lubricated by a positive-pressure lubricating system and other units by means of a splash system.

Timken roller bearings are used for the spindle, which is



driven through herringbone gearing, and all intermediate feed shafts are mounted on ball bearings. Power is transmitted through multiple-disk clutches. The cross-slide of the unit type is operated by means of an integral cam drum, the travel each way being 3¼ in. The conventional type of overhead support arm has been eliminated from the large turret, an automatic sliding device being provided instead. The turret has five faces, the holes in them being 2 in. in diam. The distance from the center of the turret hole to the top of the turret slide is 2¾ in. The maximum travel of the turret slide, exclusive of 2½ in. for revolving it, is 9½ in., and the length of the turret slide is 4¼ in. A hole 1 5/16 in. in diam. is provided through the spindle. The swing over the bed is 21 in., and the swing over the cross-slide is 9¾ in. The turning limit for standard tools is 9 inches.

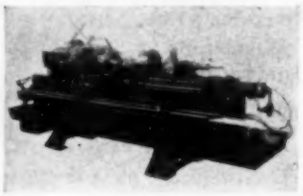
Change gears give spindle speeds ranging from 24 to 535 r.p.m. Standard feed change gears give feeds per rev. of the spindle from 0.004 to 0.047 in., and the auxiliary reaming and threading attachment gives feeds per rev. from 0.050 to 0.121 in. From 5 to 7½ hp. is required to drive the machine, which is arranged for single pulley drive, but which may have a motor fitted on a base at the rear of the headstock.

— 141 —

Chucking Machine, Automatic, Nos. 1-, 2-, 3-, and 4-F, "Fastermatic"

Foster Machine Co., Elkhart, Ind. [Vol.70, p.1023]

The machine is built in the platen and automatic indexing turret types in four sizes with respective swings over the beds of 17, 22, 25½, and 33 in. All feeds are actuated from an Oilgear control pump. During the periods of feeding, a constant differential oil pressure is maintained on the piston, so that the back pressure prevents jumping at gaps in the work. The feeding movements range from 0 to approximately 40 in. per min. The cams, which may be easily and quickly adjusted, give the



desired feed and maintain it automatically.

Return of the tooling from the work is effected automatically through the rapid traverse action of the ram. The rapid traverse can be started automatically during any portion of the feeding movement, thus reducing the time on work having wide spaces between the turned or bored lengths.

With the platen-type Fastermatic, the tool carrying units consist of front and rear cross-slides and a main slide, all of which are mounted on a platen. When desired the platen movement can be reduced to any rate of travel required for feeding auxiliary tooling.

In the indexing turret-type Fastermatic, the tool carrying units consist of front and rear cross-slides mounted on a bridge spanning the bed, and an automatically-indexed hexagon turret. The longitudinal movements of the turret faces are controlled by cam action. The cross-slides can be operated simultaneously or independently, and they can be timed to operate in conjunction with any one of the turret faces. At completion of the cycle, the entire tooling is moved clear of the work until the feed is re-engaged. Provision is made for the use of overhead piloted tooling as well as that central piloted. Chucks such as used on the ordinary turret lathe are readily used.

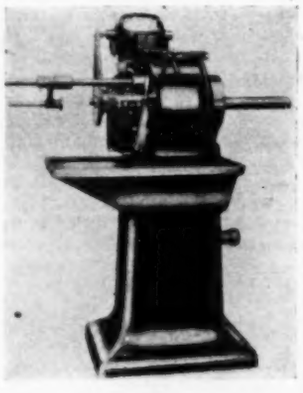
Eight spindle speeds are available for the Nos. 1-F and 2-F machines and twelve spindle speeds for the Nos. 3-F and 4-F units. All Fastermatics are equipped with Timken bearings on the spindles, ball bearing backshafts, multi-disk clutches, and an all-steel gear train operating in oil.

— 142 —

Cutting-Off Machine, Bar and Pipe, No. 602

Oster Manufacturing Co., Cleveland, Ohio. [Vol.70,p.568]

Bar stock from ⅜ to 2 in. and pipe or tubing from ¼ to 1½ in. may be cut off on this revolving-head, blade-type machine. Advantages claimed are: Minimum weight, power and floor space, and no whipping of stock. The machine is powered with a universal motor operating on either a.c. or d.c. 110-volt circuits. The drive from the motor is through a silent chain to a jackshaft mounted in Timken roller bearings. The jackshaft carries the speed clutches and also drives the spindle, which is also mounted in Timken roller bearings. The cutter head is provided with two



cut-off blades mounted opposite each other.

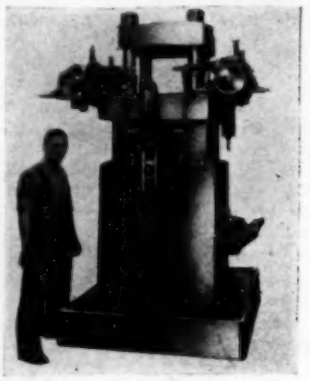
The cut is first taken by a U.S.S. form tool, which has half of its V in advance of the flat tool, thus splitting the cut into three chips, assuring long life of the blades. A universal, direct, lever-operated scroll chuck is used. Stopping of the blade at the proper limit of travel for both inside and outside diameters is accomplished by two stop collars. Except on tubing, one operator can handle two or more machines.

— 143 —

Dieing Machine, 75-Ton

Henry & Wright Manufacturing Co., Hartford, Conn. [Vol.70,p.297]

Capacity to produce metal stampings from heavier material than can be used on the 25- and 30-ton dieing machines, and also to permit the production of formed or drawn parts up to 2 in. in depth in a single operation in progressive dies, is built into the 75-ton dieing machine. The parts for which the machine is especially adapted are heavy hardware, automobile accessories, medium-sized motor laminations, and electrical parts.



The 25-ton machine was described on page 498, Vol. 49, and the 50-ton model on page 526, Vol. 55, of the *American Machinist*.

Any portion of this machine can be placed below the floor line, and the starting and stopping treadles can be arranged at any desired height. Both the upper and lower bases are made of semi-steel castings and the entire machine is mounted on a heavy floor plate.

The lower crosshead is guided on long ways of improved design to assure alignment at all times. The four guide rods are made from heat-treated, chrome-nickel steel, and are guided in long, adjustable, taper-bronze bearings. The lower end of the connection or wrist is fitted into the lower crosshead of the machine.

The clutch drum is forged integral with the crankshaft, which may be furnished in any stroke up to 8 in. standard and 12 in. special. The distance from the bottom of the bolster to the bottom of the upper head, stroke up, adjustment up, (open-height) is 16 in., and the shut height, standard stroke, is 10 in. The dimensions of the upper base overall are 30¼x30¼ in., and the available work surface is 30¼x15 inches.

The maximum width of metal that can be fed is 12½ in., and the length of feed may be from zero to 8 in. standard, or up to 12 in. special. The minimum length of strip possible to feed is 46 in. The maximum speed range is from 125 to 150 r.p.m.

An important feature is that the clutch pin cannot engage the driving plug until the brake is entirely released, nor can it be withdrawn until the brake is entirely closed on the drum. Lubrication is by means of Alemite-Zerk system.

Weight, equipped with a double-roll feed and bolster plate, 21,000 lb.; floor space, 60x 75 in.; height, 96 inches.

— 144 —

Hammers, Electric

Millers Falls Co., Millers Falls, Mass. [Vol.70,p.338]

At present, four distinct sizes are manufactured in capacities to drill ⅝-, 1⅛-, 1½- and 2-in. holes in concrete, respectively. Several models of each are supplied for the usual voltages and frequencies. In addition to drilling holes in concrete, chipping, chiseling wood, and scaling are representative operations.

Windings inside the body of the tool form powerful magnets

when energized by alternating current. These draw the piston in the center cylinder back and forth at the rate of 3,600 blows per min., when the device is operated from a 60-cycle circuit. The length of stroke is ⅜ in., and the power consumption for the smallest size is ⅛ kw. Each hammer is furnished with a 40-ft. extension cord, drill chuck, drift pin, and case.

Weight of smallest and largest sizes, 9 and 20 lb., respectively. Diameters, 3½ and 4 in. and lengths, 10 and 14 in., respectively.

— 145 —

Hammers, Riveting, Boyer

Chicago Pneumatic Tool Co., 6 East 44th St., New York, N. Y. [Vol.70,p.681]

Simplicity in design is the outstanding feature of the improved Boyer riveting hammer. The entire valve unit is composed of only three members, a valve case, a hollow cylindrical valve, and a valve case lid. In operation, the piston passes through the valve. This construction provides several advantages, which are: Shorter overall hammer lengths, powerful strokes, large airports, prevention of sluggish action, and a cushioning effect. It also removes the possibility of the piston striking the handle on the return strokes.

The standard Boyer long-

stroke riveting hammers are built in seven sizes having capacities for ⅝- to 1¼-in. rivets. The heavy type is built in three sizes, with capacities for ¾- to 1½ in. rivets. Overall length of the former varies from 14⅜ to 23¾ in., and for the latter 17⅛ to 20⅝ in. Weights for the former type range from 15¾ to 28½ lb. and for the latter from 23½ to 26½ pounds.

— 146 —

Hammers, Mechanical, Electrically-Operated, Nos. 3 and 6 "Electrair"

Gifford-Brown Sales Co., Inc., 1 Broadway, New York, N. Y. [Vol.70,p.951]

These two sizes of electro-mechanical hammers are suitable for chipping, chiseling, caulking, die-making, cleaning castings, wood-cutting and stone work. Each outfit consists of a portable driving motor, a flexible shaft, and the hammer itself. A single-throw crank transforms the rotary motion of the shaft to a reciprocating one for imparting the hammer blow, and an ingenious air cushion is used to prevent a metal-to-metal contact between the work and the moving parts. No blow is struck until the tool is pressed against the work, and the force of the blow is determined by the extent of that pressure until the maximum pressure is reached.

The tool body itself is made of aluminum with a steel nose for holding the tool. Either a.c. or d.c. G.E. fully-inclosed motors are furnished regularly

for connection to a light socket. Handles are attached to the motor for convenience in carrying. Separation of the motor and tool by a flexible shaft makes for lightness and cuts down excessive pounding. Fully-inclosed motors are furnished.

The No. 3 Electrair is driven by a 1/15-hp. motor operating at 3,500 r.p.m., and is supplied with a flexible shaft 4 ft. long. The hammer itself weighs 1½ lb. A ½-in. cold chisel and a ⅜-in. star drill are standard equipment. The No. 6 is driven by a ¼-hp. motor and has 5 ft. of flexible shaft. The speed is 1,750 r.p.m. Hammer weight 5½ pounds.

— 147 —

Nut Setter and Screw Driver, "Niedhammer"

Chas. L. Jarvis Co., Gildersleeve, Conn. [Vol.70,p.74]

The principal features of the "Niedhammer" nut setting and screw driving chucks are that the amount of friction between the driving and driven members can be closely adjusted to suit each particular job, and as a screw or nut becomes tightened, a hammering effect is imparted to drive it securely home. This

tool can be used in a drilling machine, electric or air drill, and on a flexible shaft. It can be driven from a Morse taper, a taper nose, or can be fitted to the outside of the spindle. It is made in four sizes to drive screws of ¼, ⅜, ½, and 1 in., respectively, and setting ⅞-, 1-, 1⅛-, and 1¾-in. nuts, respectively.

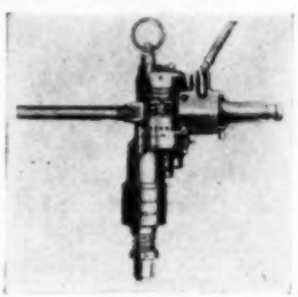
— 148 —

Nut Runners, "Hicycle"

Chicago Pneumatic Tool Co., 6 East 44th St., New York, N. Y. [Vol.70,p.914]

The No. 40-N nut runner is one of a line of "Hicycle" portable electric tools equipped with the "Uniloy" jointless rotor, which operates at high sustained speed, secured by a frequency of 180 cycles. All revolving parts are suspended on ball bearings. A cushion clutch with automatic release takes the shock of impact. When the nut is driven to desired tension, the clutch automatically releases. A reversible switch is obtainable at additional cost.

The tool comes in four sizes for nuts on bolts ⅜, 7/16, ½ and ⅝ in. in diam., for which the loaded speeds are 1,025, 650, 450 and 250 r.p.m. Overall length, 18 in. Net weight, 18 lb. The



7/16-in. hexagonal shanks are standard for socket wrenches.

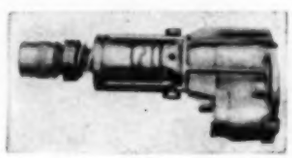
Features of the tool are: removable vertical suspension ring with a boss to hold an eyebolt for horizontal suspension; removable rotor shaft; Zerk fittings for lubrication; quick adjustment for various classes of work; malleable iron gear case and transfer plate; knock-out plugs to facilitate removal of bearings. Other "Hicycle" tools consist of a grinder for 6-in. wheels, and drills, reamers, screw drivers, tappers, buffers, sanders and stud setters.

— 149 —

Nut-Driving Attachment, "Kick-Out," Thor

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill. [Vol.70,p.374]

Correct tightness of every nut driven can be obtained by means of the Thor "Kick-Out" nut-driving attachment, according to the manufacturer. The device is made in several sizes for driving nuts from 7/16 to 1½ in. The attachment is inclosed by a sleeve extending over the two clutches, thus protecting all the moving parts from dust or grit. It is designed especially for use



with Thor high-frequency, 180-cycle, electric tools, but it can also be used with universal electric tools in various sizes.

The attachment is adjustable so as to take care of a variety of sizes of nuts and capscrews.

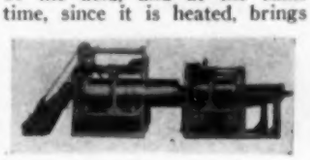
— 150 —

Pickling and Tumbling Machine

Ideal Industrial Machinery, Div. of the Consolidated Concrete Machinery Corporation, Cincinnati, Ohio. [Vol.70,p.298]

This machine which combines the operations of tumbling, pickling and washing is made up of two units, the first being the star-return barrel with a lead-lined tank underneath for catching the 2 per cent sulphuric-acid pickling solution, which is pumped over the work while the tumbling is taking place. It is stated that the average drop forging requires only 10 to 20 min. for complete de-scaling.

The star-return barrel discharges the work into unit No. 2 which is an "Ideal" No. 5 continuous-process, metal cleaning machine. The work passes directly through this machine, which is filled with an alkaline cleaning compound, which washes off the sludge of tumbling, neutralizes what remains of the acid, and at the same time, since it is heated, brings



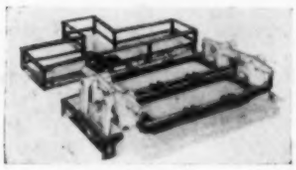
the work up to a sufficiently high temperature so that it will dry without rusting. Unit No. 1 was described on page 182, Vol. 69, of the *American Machinist*. The combined machine may be used for cleaning parts covered with scale from heat-treating.

— 151 —

Pickler, Suspended-Frame

Nukem Products Corporation, 70 Niagara St., Buffalo, N. Y. [Vol.70,p.491]

Rapid and economical pickling of sheet-metal and cast-metal products with low upkeep, while maintaining clean, dry surroundings, can be obtained by the use of this suspended frame pickler. Brick tanks, bonded with "Basolit" manufactured by the above company, are used for the process, and they are protected from



injury by means of the frame. Loads of parts or sheet metal weighing up to 5,000 lb. are placed on the frame by means of cranes and by the same means are transferred from the acid bath to the water rinsing tank.

A steel skeleton frame is suspended above each tank by links attached to the ends of the levers. A motor drives the frames up and down through the solution or water by means of connecting rods, thus washing the work. The action of the water, due to the movement up and down, gently separates the sheets or parts so that the solution reaches every portion.

All important moving parts have roller bearings. The blocks carrying levers are of heavy cast iron, while the steel frame is built for a load of 5 tons. The carrier frame is also made of steel. All metal within reach of the acid is coated with aluminum bronze to prevent corrosion.

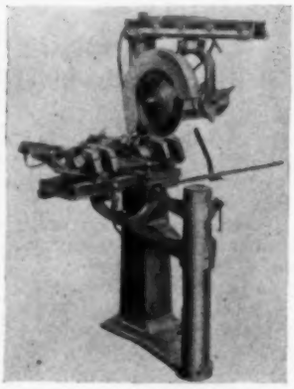
The tanks used in the standard installation are 4 ft. 8 in. wide, 6 ft. deep, and 13 ft. long, all inside dimensions. The extreme width of the set-up is 23½ ft., and the extreme length is 28 ft. Standard installations require a 10-hp. motor for drive.

— 152 —

Saw, "Wonder Metal Worker"

DeWalt Products Corporation, Leola, Lancaster Co., Pa. [Vol.70,p.298]

Tubing and formed metal can be cut rapidly and smoothly by means of the "Wonder Metal Worker" metal-cutting saw,



which is driven by a 5-hp. overhead motor. The cutting unit is adjustable to any angle and it will cut standard tubing up to 3 in. in diam. having a ⅛ in. wall thickness. The saw operates at 3,600 r.p.m. and will give three to four days continuous operation on cutting molybdenum steel tubing of ⅛ in. wall thickness before resharpening. Eight to ten days is the usual service on low-carbon steels.

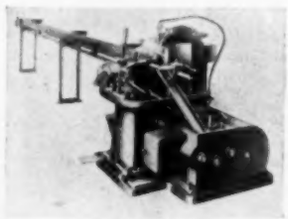
The saw is 12 in. in diam., and is hollow ground. A manual feed is provided. For holding the work, an air-actuated vise, developed by the Bowlby Air Devices, Inc., 1,500 Fairview Ave., Wichita, Kan., is used. This device is described elsewhere in this issue.

— 153 —

Saw, Cut-Off, High-Speed, Automatic

Cochrane-Bly Co., Rochester, N. Y. [Vol.70,p.723]

Brass, copper and aluminum bar and tubing may be cut to length automatically. The machine will also cut hard rubber, Bakelite, and wood strip. It has a power stock feed and automatic clamping vise and trip. Capacity to cut 2-in. copper bar, 3-in. brass bar, 4-in.



brass or copper tube, and also flat bars and extruded shapes is provided.

The movement of the saw carriage is adjustable from ⅛ to 4½ in. and the speed is variable from 5 to 50 strokes per min. with standard speed gearing. Provision is made for much faster operation on small special work. A heat-treated saw spindle, mounted in dustproof Timken roller bearings, is used. Drive from the motor is positive by means of a silent chain. Motors furnished are of the constant-, variable-, or multiple-speed types, as desired. According to the manufacturer, it is possible to use a highly-tempered blade and thereby obtain smooth cuts at high speed.

— 154 —

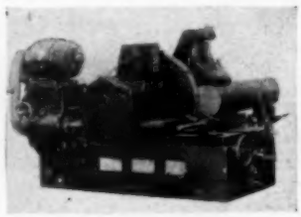
Sawing Machine, Metal, Cold, "High Efficiency"

Steinle Turret Machine Co., Madison, Wis. [Vol.70,p.1027]

Seven sizes of metal cutting-off machines having capacities ranging from 1¾ to 20 in. are offered. These machines are of the "Heller" make. The constructional features include sturdy design, all-steel gearings, ball bearings, and a long saw-arbor-carriage slide bearing, the final saw arbor drive being through a wormgear unit. The blade cuts the stock on the upward motion, thus placing the stress of the cut directly on the spindle carriage rather than on the bearing cap.

Four blade speeds and five blade feeds are available. A clutch acts as a safeguard against excessive pressure. Adjustable feed trips are provided, and at the completion of the cut the blade carriage returns automatically to the starting position by quick power traverse.

The work is fed to the stock stop mechanically by a roller arrangement which positions the work accurately. Clamping of the stock is facilitated by means



of the hammer-type clamping wheel. Drive is through a single pulley direct to a change gear box.

A deep sump for coolant compound is built integral with the machine base. Where motor drive is desired, the motor is placed upon the top of the gear-box and drive is through a belt with idler pulley arrangement. The blades furnished with the machine are of the original "Heller" segmental type composed of a center disk of heat-treated, high-tensile steel having a set of high-speed steel segments, riveted on the periphery. Each segment comprises four cutting teeth, the teeth being of the beveled-roughing and square-finishing types, alternately, so that the chip is split into three parts.

Specifications for the several models are: Capacity, rounds, 1¾ to 18 in., squares, 1⅜ to 16½ in., I-beams, 3x2 to 30x14 in.; motor required, 2 to 25 hp.; weight, 800 to 19,000 lb. These machines are also built in a special type with a rotary base and cross-feeding tables for angle cutting, and also in types for crankshaft work, frog and rail cutting, and foundry sprue cutting.

— 155 —

Vise, Air-Operated

Bowlby Air Devices Co., 1600 Fairview Ave., Wichita, Kan. [Vol.70,p.298]

Tubing and various formed sections may be held securely in this "Air Vise," which is intended primarily for attachment to the De Walt "Wonder Metal Worker" described on page 298, Vol. 70, of the *American Machinist*. Forward, backward, and horizontal adjustments can be made quickly. An air trip actuates the jaws. A view of the vise is available in this issue under Item No. 152. on the De Walt Wonder Metal Worker announcement.

The Air Vise consists of a table and standard upon which are located the pistons and air-actuated vise jaws. The air pressure may vary from 30 to 150 lb. per sq.in., but pressures above 50 lb. per sq.in. are necessary to obtain the most rigid clamping when cutting above ¼-in. standard tubing. Interchangeable jaws are available for heavy work. Compression rings are fitted into cylinders to prevent wasting air.

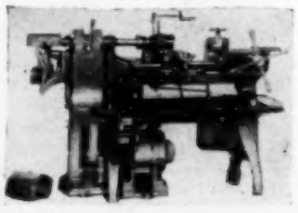
— 156 —

Screw Machines, Wire-Feed, Motor-Driven, Nos. 0, 1, and 2

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.335]

Unusual simplicity of control and flexibility of operation are afforded the producer of small job lots of screws, studs, and similar parts by Nos. 0, 1 and 2 motor-driven, wire-feed screw machines. They are of the same capacities are the belt-driven models announced previously. The spindle reverse is operated by a single lever. Two speeds are available instantly, either being secured by shifting the clutch lever. When an opening die is being used, the fast- and slow-speed pulleys can be arranged to run in the same direction.

The main driving motor is located under the machine. It



has four changes of speed. A small motor at the rear is geared to the driving shaft to provide a constant rate of feed,

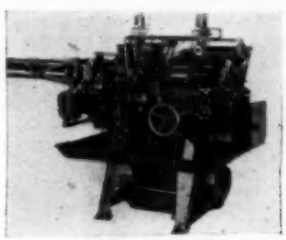
regardless of the spindle speed. The holes through the largest feeding finger of each machine are ⅜, ½ and ⅝ in., respectively, and the lengths that can be turned are 2¼, 3, and 5 inches.

— 157 —

Screw Machine, Five-Spindle, Automatic, Redesigned, Model B

Davenport Machine Tool Co., 167 Ames St., Rochester, N. Y. [Vol.70,p.949]

An important feature of the redesign of this machine, originally described on page 753, Vol. 63, of the *American Machinist*, is that the two sets of cams that feed and return the tool spindles and cross-slides are now assembled on sleeves, so that all of the cross-slide cams, or the tool-spindle cams, can be quickly inserted or removed as one unit. Two sets of sleeves are furnished so that when the machine is operated on jobbing work, cams to suit



the next job can be assembled for substitution on the machine.

All cams for the cross-slides are now located at the front. Both camshafts run at one speed for one-half of each revolution and at another speed for the remainder. While the camshafts are turning at the faster speed, the tools are returned from the work, the work-head unit is unlocked, indexed and relocked, and the stock is fed into the chuck that has been indexed in the loading position. While the camshafts are rotating at the slower speed, the tools are fed to the work.

Other improvements include a threading clutch that can be employed in machining both brass and steel. Brass parts can be produced at rates up to 60 per min., which necessitates 120 engagements and disengagements of the clutch per minute. Indexing of the head is accomplished through a Geneva movement. Provision is made for quickly feeding the stock into the chucks. Up to 3 in. of stock may be fed at a time and the tools can turn up to 2¼ in. in length.

A chip conveyor can be furnished to carry the chips to the right-hand end of the bed and there discharge them into a receptacle. The oil drains from the chips into the pan of the machine while the chips are being carried away by the conveyor. Provision is regularly made for carrying the work pieces, free from chips, to a receptacle at the right-hand end.

— 158 —

Feed Pusher for Automatic Screw Machines, "H & G"

Eastern Screw Machine Corporation, New Haven, Conn. [Vol.70,p.377]

This feed pusher for multiple-spindle automatic screw machines is composed of two principal parts, the master which fits on the end of the customary feed tube, and the inner pusher which is installed inside of the master. A taper inside the

master corresponding with one on the pusher, causes the inner pusher to grip the stock firmly when the feed tube is pushed forward for feeding. When the feed tube is drawn backwards the inner pusher is in the released position and slides freely over the stock.

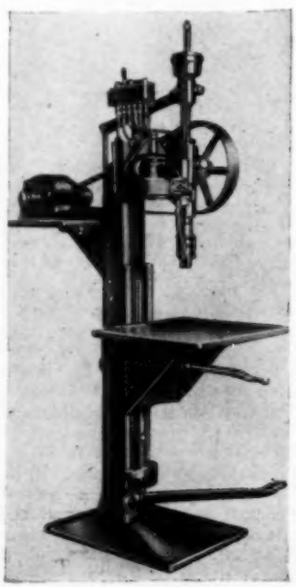
It is only necessary to change the inner pusher when changing from one size of stock to another, the master remaining as a permanent part of the machine. The advantages claimed are: Positive grip and positive release, uniform feed, elimination of rebound and drag marks.

— 159 —

Screw Driving Machine, Heavy-Duty, No. 2

Reynolds Machine Co., Massillon, Ohio. [Vol.70,p.452]

Any three consecutive sizes of wood or machine screws from Nos. 6 to 14 inclusive, can be driven by this machine, which



is equipped with an automatic magazine feed. It will drive screws to the center of an 18-in. circle in work not over 18 in. high, and on work requiring greater depth of throat a gap column may be substituted. This column permits screws to be driven to the center of a 48-in. circle in work not over 6 in. high.

All screws below No. 10 must not be longer than 1½ in., while from No. 10 to 14 inclusive, screws 1¾ in. long can be driven. The range of screws driven can be increased by the use of an interchangeable set of parts, but no change is necessary for different lengths of screws. A boring attachment can be furnished extra.

The spindle runs at 700 to 850 r.p.m. It is actuated by a treadle equipped with a spring that causes the spindle to return to the upper position after a screw has been driven. The machine is driven by a motor belted to the spindle, but a belt-driven type may be obtained. The large table is 21x24 in., and the base is 21x27 inches.

— 160 —

Screw Driver, Electric

Schauer Machine Co., Successor to the Neal & Smith Electric Tool Co., 905 Broadway, Cincinnati, Ohio. [Vol.70, p.918]

This positive-clutch electric screw driver is similar to the ¼-in. drill described under item 24 of this issue, except that it is available for operation at 400, 250, and 200 r.p.m. for driving Nos. 10, 14, and 20 screws, respectively. It is equipped with the same motor. In the illustration, the finder, which is

standard in all sizes, is shown cut away about the bit which remains stationary until the clutch is engaged by a light pressure. A feature of this tool is that no moving parts are exposed to mar the work in case of slipping or close-quarter operation. The tool can be supplied with a socket for nut tightening.

Weights are 6½, 7, and 12 lb.; lengths, 12¾, 12¾, and 15 in., respectively.

— 161 —

Bolt Assembling Machine, Automatic

Asa S. Cook Co., Hartford, Conn. [Vol.70,p.187]

This automatic bolt assembling machine will deliver bolts completely assembled with the nuts. Two sizes are offered,

one handling bolts up to ¼ in. in diam. by 3 in. long, and the other unit taking bolts up to ½ in. in diam. by 6 in. long. The quoted production is 60 assembled bolts per minute.

In operation the screws are fed from a center-blade hopper down a gravity way, from which they are picked by a finger operated by a cam on the camshaft at the rear of the machine. The nuts are fed from a standard "National" hopper, and are held firmly while the bolts revolve.

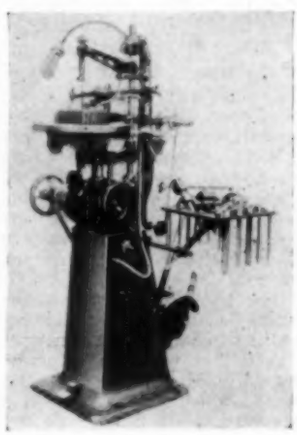
The assembled bolt is thrown into a chute, and if, for any reason, the nut does not screw on the bolt, it does not enter the chute, but is dropped directly down into the pan of the machine. One operator can run from four to six machines. The cast-iron bases are planed on the ends, and arranged so that the machines can be bolted end for end, and operated from one drive shaft with motor.

— 162 —

Filing and Sawing Machine, Die, Precision, Thiel, Nos. 2, 3 and 5

Marburg Brothers, Inc., 90 West St., New York, N. Y. [Vol.70,p.722]

This improved Thiel precision die filing and sawing machine has a box column and improved table support. The machine is used for operations such as sawing out or finishing small, irregular holes. It comes in three standard sizes known as Nos. 2, 3, and 5, the first two being for small and medium



work and the last for extra large work.

Lower and upper arms, which support files and saws, are mounted on a spindle. The upper arm can be set as desired, permitting the shortening and lengthening of the holding frame. The Nos. 2 and 3 machines are adapted for jewelers' saws up to those ⅜ in. in width, and for files in thicknesses from $\frac{3}{64}$ to ½ in. Thin files are held under tension and larger files in ring-shaped holders. Saws are of two distinct types, short lengths and coils, the former type being held in the same holder as the files, while the latter are held in magazines. The table is easily raised and lowered and can be tilted up to 15 deg. in four directions.

Adjustable holders retain the work on the table. The stroke of the machine is adjustable. With the exception of the smallest sizes, these machines are equipped with both hand and automatic feed. Four speeds are provided and the smallest sizes admit work up to 2 in. thick and the largest up to 5 in. The machines are supplied for either belt or motor drive.

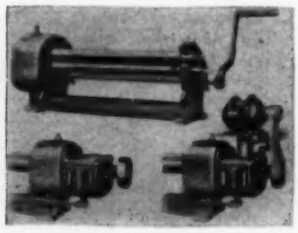
Weights, 395, 590, and 870 lb., respectively.

— 163 —

Former, Sheet-Metal, Slip-Roll, 3-Inch

Niagara Machine & Tool Works, 637 Northland Ave., Buffalo, N. Y. [Vol.70,p.839]

This machine is intended for forming sheet metal in cylindrical shapes. Operators work at the handle end of the machine entirely, thereby reducing the time for finishing each job. No lifting of rolls is required. The top roll is pivoted at the left-hand end, and swings forward for the removal of finished work. Three lengths of rolls are available, 36, 42, and 48 in.



They can be furnished for either hand operation, pulley drive, or belted motor drive.

Rolls are turned and polished. Grooves ⅛, ¼, and ⅜ in. wide, are provided at the right-hand end of the back and bottom rolls to permit the forming of work that has outside wired edges.

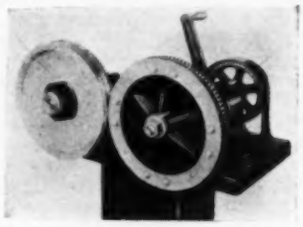
The base extends across the entire length of the machine, and is of channel-type construction. The machine is single geared. Maximum capacities can be rolled without reduction of speed. All three rolls are positively driven, making possible the rolling of small diameters. A clutch-type operating lever is mounted at the right-hand end of the machine, permitting rolls to be run forward or backward, started or stopped at will.

— 164 —

Graduating Machine, Rotary, Special

Noble & Westbrook Manufacturing Co., Hartford, Conn. [Vol.70,p.720]

The special rotary graduating machine was designed and built to graduate a 12½-in. aluminum disk having 400 division and numbers at every five divisions.



The numbers and the graduations are rolled on in one operation by steel marking dies. These dies are made of special steel and are mounted on a carrying wheel. Pressure needed to roll the graduations and numbers is applied through a treadle and a lever carried inside of the column. The machine is operated by a hand crank.

Weight, 375 pounds.

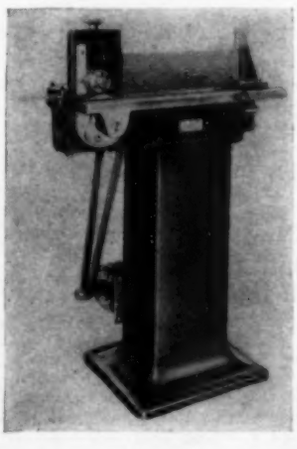
— 165 —

Marking Machine, Strip, Rapid-Production

Noble & Westbrook Manufacturing Co., 20 Westbrook St., East Hartford, Conn. [Vol. 70,p.911]

Marking of flat metal strips at the rate of forty strips per min. can be done on this machine. Each strip is marked ten times on both sides, thus making 800 separate marks per minute. The machine is fed by hand by an operator who can easily keep two machines supplied.

The marking die used on this unit is made in the form of a roll 2½ in. in diam., on which five trade-marks and five descriptions are engraved. The feeding mechanism is operated by a cam inclined so that the bottom strip in the magazine is started under the die as soon as the preceding strip leaves it. The operator has only to keep the machine magazine supplied. Drive is furnished by a ¼-hp. motor.

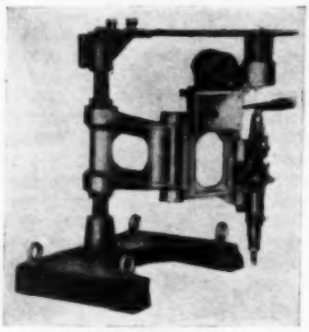


— 166 —

Plate Cutting Machine, No. 4, "Camograph," Airco-Davis Bournonville

Air Reduction Sales Co., 342 Madison Ave., New York, N. Y. [Vol.70,p.417]

Production cutting of steel plate to various sizes by means of the oxy-acetylene flame can be done on this No. 4 "Camograph," which mechanically carries and traverses the torch to the desired outline by means of cams of either the internal or closed type or of the open form.



The machine comprises a 13x20-in. U-shaped space, in which is fitted a vertical steel post, to which the moving parts are pivoted, as well as a cam holder. The mechanism includes two hinged aluminum arms mounted on Fafnir ball bearings, and a hand-operated vertical slide on the end of the outer arm, which, in turn, carries the cutting torch, motor, switchbox, gearing, and electromagnet.

The vertical steel cam roller is the magnet core, which is revolved through worm gearing by means of a small motor. The cam roller slowly rotates and passes along the outline of the internal cam by virtue of the traction afforded by the knurling.

The machine base has an arch beneath the post that admits a section ⅜x16 in., and provides for feeding plate from the rear, when cutting would be facilitated by so doing. The vertical movement of the slide and torch is 5 in. and the largest circle that can be cut is 14 in., the maximum reach being 18 in. The largest segment cut back of the post is 13x33 in., and the cutting speed is variable from 2½ to 28 in. per min. Weight complete 150 pounds.

— 167 —

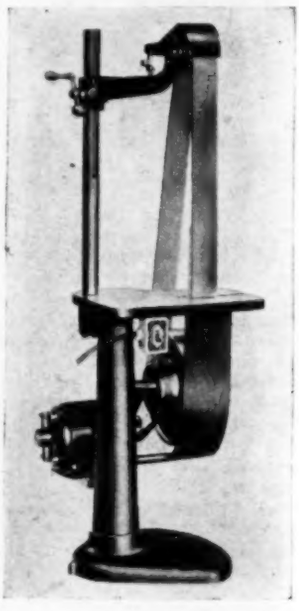
Sanding Machine for Irregular Work, Type B-6

Porter-Cable Machine Co., Syracuse, N. Y. [Vol.70,p.991]

For the sanding of intricate shapes, polishing brass and aluminum, and other work, this machine has been introduced. It is an irregular belt sander, using any width of belt from ½ to 3 in. The belt passes over a pad directly above the table, against which the operator works as if at a bandsaw.

The machine takes lengths of belt from 95 to 125 in., allowing more room for larger work when necessary to swing it back of the belt. The device is portable and operates from a lamp socket. Power is transmitted from the motor to the drive pulley by a belt. Pulleys are rubber-covered. The type B-6 sander can be equipped in two speeds, 1,975 ft. per min. for wood or 3,425 ft. per min. for metal.

Specifications are: Table, 13x19 in.; height of table from floor, 33¾ in.; travel of arm on post, 16 in.; overall dimensions, 65¾x22x27 in.; net weight, 265 lb.; speed specified is for 60 cycles or d.c. motors. Equipment supplied includes: ¼-hp. ball-bearing motor, 6 belts, flexible pad, and a switch.



— 168 —

Spinning Machines, Rivet, Rotary, No. 10, Noiseless

Linley Brothers Co., 581 Fairfield Ave., Bridgeport, Conn. [Vol.70,p.335]

Four models of the Noiseless No. 10 rotary rivet spinning machine are manufactured. The unit illustrated is of the hori-

zontal, motor-driven, bench type. The other three models consist of: Countershaft-driven bench and pedestal types, and a horizontal, motor-driven pedestal type. All have capacity for spinning rivets up to $\frac{5}{32}$ inch.

The $\frac{1}{2}$-in. spindle stroke is operated by a cam and lever system, which, with the short treadle travel, delivers unusual power throughout the entire movement. The spindle is threaded for the attachment of a roller holder. Screw adjustment is provided for the table. The distance from the center of the spindle to the column is 4 in., thus permitting riveting of large parts, and mounting of automatic fixtures on the table. The table drops $5\frac{1}{2}$ in. from the spinning rolls, and has an area of 4x$5\frac{1}{2}$ inches.

Phosphor-bronze bearings are used on the spindle and bronze bushings on the idler pulleys. Overall height is $17\frac{3}{4}$ inches.

— 169 —

Swaging Machine, No. 6 HS-11

Langelier Manufacturing Co., Arlington, Cranston, R. I. [Vol. 70,p.495]

Automatic feed obtainable either by means of compressed air or by an Oilgear hydraulic feed unit is available on the No. 6 HS-11 swaging machine. The capacity of the machine, which can be used for either hot or cold swaging, is 3-in. steel tubing, $1\frac{3}{4}$-in. solid rod, cold, and $2\frac{1}{4}$-in. solid rod, hot. The die used is $3\frac{3}{4}$ in. long, but the machine can be supplied with die lengths varying from 6 to 12 inches.

One of the features of the work-holding and power feed-

ing units is heavy construction to avoid vibration. The feeding table has a surface of 21x48 in. with two lengthwise T-slots for attaching various types of fixtures. The table has a maximum travel of 30 in., and is operated by a compressed-air cylinder or by an Oilgear feed.

The work-holding fixture on the table consists of a draw-in collet chuck operated by a compressed-air cylinder. Means are provided for revolving the entire draw-in collet unit through a combined belt and spur gear drive from a small motor mounted on the table. The chuck is opened and closed automatically by an adjustable cam bar attached to the rear of the base.

Floor space required, 4x12 ft.; weight 16,000 pounds.

— 170 —

Washer, and Dryer and Oil Extractor, Centrifugal

Leon J. Barrett Co., Worcester, Mass. [Vol.70,p.379]

The line of self-contained, motor-driven centrifugal machines for extracting oil from chips and for washing and drying machine parts, which is built by the above company, has been redesigned and another size added. The line now comprises three sizes as follows: No. 252,

having capacity of 1,440 cu.in.; No. 502, having capacity of 3,720 cu.in., and No. 1200 having capacity of 7,500 cu.inches.

A two-spindle construction is now available, the machine being arranged so that the bowl is fixed within the spindle and a variety of comparatively light plain or perforated containers can be fitted directly into the fixed bowl. A quick-acting light cover has been provided, which is easily locked and unlocked. For facilitating loading and unloading, a suitable hoist has been designed.

The starting switch and safety locking arrangements have been improved and relocated to interlock. The suspension of the rotating unit has been rearranged.

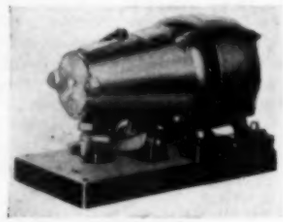
— 171 —

Wire Stripper, "Perfection"

Weber Machine Corporation, 33 S. Water St., Rochester, N. Y. [Vol.70,p.416]

The "Perfection" wire stripper incorporates a number of improvements over the Mahan centrifugal wire stripper from which it was developed, and which was described on page 791, Vol. 68, of the *American Machinist*. This model removes all kinds of insulation from the ends of stranded multi-conductor cable or wire up to $\frac{1}{4}$ in. in diam. Circular, hollow-steel knives are used.

The machine is equipped with ball bearings throughout and is readily adjustable. Model A, shown, is direct-connected to a motor, the type depending on the current to be used. Model B is designed for use where un-



limited lengths of wire or taps at any interval along the wire are to be stripped. It is mounted on a stand and is belt driven from a motor or a lineshaft.

Polishing Equipment

— 172 —

Buffing and Polishing Lathe, "Rite-Speed," Extra-Wide

Hill-Curtiss Co., Kalamazoo, Mich. [Vol.70,p.261]

Buffing of automobile fenders can be done on this extra-wide polishing and buffing lathe, which will accommodate two operators. The spindle has a length over-

all of 80 in., and is driven by multiple Texrope drive. The speed is changed easily by changing the motor pulley. The motor is mounted on the back of the pedestal for accessibility.

Push-button remote control, and an automatic starter and thermal overload protection are standard equipment. Timken tapered roller bearings or Fafnir ball bearings are optional equipment. The "Hill-Curtis" air cleaner is applied to the motor. The polishing lathe can be furnished with a 3-, 5-, $7\frac{1}{2}$-, 10- or 15-hp. motor, for either a.c. or d.c. circuits.

— 173 —

Polishing Lathe, No. 3-CB

Gardner Machine Co., Beloit, Wis. [Vol.70,p.376]

Multiple V-belt drive is used on the No. 3-CB polishing lathe, the motor being mounted on a bracket cast integral with the machine base. Adjustment for varying the belt lengths is provided and, in the case of belt breakage, replacement can be made in a few minutes without disturbing the spindle bearings. The belts and sheaves are completely inclosed. The motor is

of the inclosed, fan-cooled, ball-bearing type and can be supplied in 5-, $7\frac{1}{2}$-, and 10-hp. sizes.

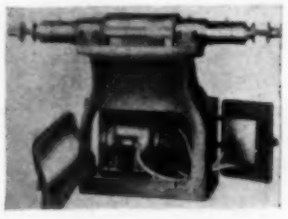
The spindle takes polishing wheels up to $3\frac{1}{2}$ in. thick. Double-row Timken roller bearings are used at each end and are mounted in dustproof cartridges, so that the entire spindle assembly can be removed as a unit. The slight overhang of the spindle provides ample clearance across the front of the machine for long work.

— 174 —

Buffing and Polishing Machine, "Texdrive"

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.70,p. 686]

Mounted on a flat base securely attached to the main frame, the motor on the "Texdrive" buffing and polishing machine drives the spindle through "Texropes." Louvres in the end door keep out dust and permit circulation of the air. The starter is of the automatic type. The extra large spindle, made of nickel steel, runs in two ball bearings ordinarily, but Timken roller bearings can be provided. A labyrinth seal covers the bearings. The bearing boxes



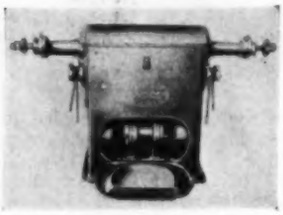
are keyed to the column so as to maintain the rigidity of the spindle and accuracy of alignment. The base is a one-piece casting designed so that the bulk of the weight is at the bottom.

— 175 —

Polishing and Buffing Machine, Double-Spindle, No. 25-D

Excelsior Tool & Machine Co., East St. Louis, Ill. [Vol. 70,p.756]

Two entirely independent spindles are featured on the No. 25-D polishing and buffing machine. A single motor drives both spindles, and any kind or type of motor can be installed. Drive is by belt from pulleys at each end of the motor. By varying the pulley diameters from 4½ to 8½ in., the spindle speeds can be varied from 1,500 to 2,750 r.p.m. An inside lever is used to raise each head, thus tightening the belt to the proper tension so that any reasonable pressure can be applied to the



wheels without the belts slipping. When the head is lowered, it rests on a friction block under the pulley, thus stopping the spindle.

Ball bearings inclosed in dustproof housings are used on the spindles, and the motor is also a ball-bearing type.

The machine is regularly supplied with a 7½-hp. motor wired for 220- or 440-volt, a.c., 60-cycle circuits in conjunction with a magnetic switch of push-button control. Normal wheel capacity is 16 in., maximum face 4 inches.

Weight 1,400 lb. complete.

— 176 —

Polishing Lathe, Double-Spindle, "Rite Speed"

Hill-Curtis Co., Kalamazoo, Mich. [Vol.70,p.759]

Designed with two entirely independent spindles and having two motors mounted in the base and two separate starting

switches and brakes, this "Rite Speed" polishing lathe has the power transmitted to the spindles by means of multiple V-belts. The unit is equipped with a Hill-Curtis combination switch and brake. With one push forward on the lever, the brake is released and the motor started. By reversing this action, the current is cut off.

Tapered roller bearings or ball bearings are optional equipment and any standard motor can be supplied. The machine is made in 3-, 5-, and 7½-hp. capacities for a.c. or d.c. circuits.

— 177 —

Buffing and Polishing Lathe, Double-Spindle

Standard Electrical Tool Co., 1938 West 8th St., Cincinnati, Ohio. [Vol.70,p.841]

An overhang of 8 in. on the spindle permits buffing and polishing long pieces where the wheel should project beyond the

buffer housing or frame. A spindle speed of 2,000 to 3,000 r.p.m. can be obtained, if desired, by changing the diameter of the pulley on the motor. The machine is built in 3-, 5-, 7½- and 10-hp. sizes. Drive from the motor in the base is by means of Dayton cog-belts. Four SKF ball bearings mounted in dustproof boxes are used on the spindle, which is made of nickel steel, and is fitted with a shaft locking device. The machine is also made with two motors in the base with each spindle independent.

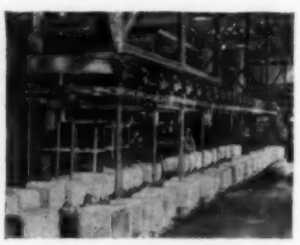
Furnaces and Equipment

— 178 —

Furnace, Vitreous-Enameling

General Electric Co., Schenectady, N. Y. [Vol.70,p.188]

This conveyor-type furnace, designed for vitreous-enameling service, is economical in operation, owing to the utilization of the so-called closed-end construction, and the elevation of the heated portion of the furnace. The furnace is built in a U-shape. The work enters and leaves by the same end, and the heating units are installed at the closed end, where the heat is concentrated, the remainder of the furnace being utilized as a heat interchange chamber be-



tween the incoming cold work and the outgoing heated work. Raising of the closed end of the furnace above the level of the remainder traps the warm air within this section and eliminates convection losses.

The heating circuits are divided into several zones, each with an automatic temperature control. The speed of the conveyor and temperature of the furnace can be changed readily to accommodate different classes of work. These furnaces are available in several standard capacities ranging about from 1,000 to 8,000 lb. of ware per hour.

— 179 —

Forge, Bench

Hall Machine & Tool Co., 116 Chestnut St., Providence, R. I. [Vol.70,p.453]

By causing the flame to impinge directly on the floor at the center, the temperature of this forge can be brought up to its

maximum of 2,250 deg. F. within 5 min. after starting, according to the manufacturer. The burner, which enters the top of the furnace at a 45 deg. angle, is equipped with a pilot light arrangement. The temperature range is from 500 to 2,250 deg. F., and any desired temperature may be maintained.

The heating chamber, which is 3x3x7 in., with no obstructions, provides ample space for the passing of long pieces through it, so that any desired spot can be heated. The furnace is constructed of cast iron and lined throughout with heavy refractory. It is supported on a sturdy stand, which brings the entrance 7 in. from the top of the bench, and takes up 14x14 in. of space. It should be operated at an air pressure of at least 1 lb. per sq.in. The forge is furnished complete with ail control valves.

— 180 —

Furnace, Copper-Brazing, Hydrogenated

General Electric Co., Schenectady, N. Y. [Vol.70,p.527]

Economical copper brazing of fabricated iron and steel products on a mass-production basis is possible by means of this hydrogenated furnace. Conveyors are used to carry the work to and away from the furnace, as well as to transport it in the heating and cooling zones of

the interior. The presence of hydrogen in the furnace cleans the metals to be brazed and not only obviates the necessity of any flux, but also insures the flowing of the copper into the joints to be united.

The furnace rests on supports above a roller conveyor, on which are a row of trays carrying the work to be loaded. Openings are provided at either end and in the bottom of the furnace for the charging of work. The furnace is heated at the entrance and cooled at the other end. Motor-operated elevators located beneath the furnace openings raise the trays of work into or lower them from the furnace.

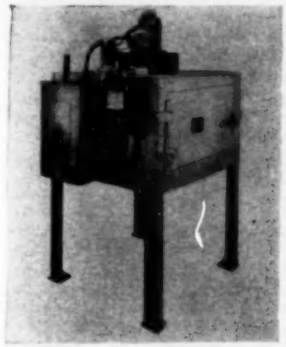
The furnace is heated to about 2,012 deg. F. The units located at the entrance end are arranged in several zones, the temperature of which is controlled automatically. In preparing the work for brazing, the parts are either wound with copper wire or coated with copper paint. The time for the complete cycle of operation is adjustable between certain limits.

— 181 —

Oven, Drawing, Type A.D.

General Electric Co., Schenectady, N. Y. [Vol.70,p.761]

This oven for drawing carbon steel at temperatures up to 750 deg. F. requires only 0.9 kw. for maintaining a temperature of 500 deg. A fan located in the heating chamber provides quick operation. The oven is of double-wall construction throughout, and the chamber is



closed by a well-insulated and closely-fitting door. A strip steel grate supports the work. One sheath wire heating unit is located at the top of the heating chamber, and a second is placed just under the hearth. The temperature control of the oven is fully automatic, consisting of an inclosed contactor panel and a controller.

Specifications: Width of oven chamber, 24 in.; depth, 21 in.; height, 9 in.; outside overall width, 40 in.; outside overall height, 61 in.; outside overall length, 33½ in.; door opening, 24x12 in.; hearth 31 in. above the floor; normal current rating, 5 kw., and capacity, 100 lb. of steel per hour at 500 deg. Fahrenheit.

— 182 —

Furnace, Non-Oxidizing

Weisberg & Greenwald, 71 West 45th St., New York, N. Y. [Vol.70,p.880]

Annealing and soldering are facilitated by a furnace offered by the Brandt Engineering Corporation, through the above sales agents. Trays of parts are put in at one end, followed through in succession, and are unloaded at the other end. The furnace occupies a space 7 ft. long by

3 ft. wide. The only extra equipment necessary is an air line at ordinary pressure and a gas connection.

Special features are uniformity of annealing under controlled conditions, and quality of annealing which makes it possible to take deeper draws or perform more severe processing operations between anneals.

Parts difficult to manufacture, such as those with sharp designs and thin edges, are readily handled in this equipment. The furnace operates without oxidizing or scaling, and consequently eliminates bright-dipping. The furnace is suitable for annealing, soldering, and heat-treating not only steel, copper, bronze, and brass, but also rare metals and alloys.

— 183 —

Diamond Block for Hardening Steel

Sentry Co., Taunton, Mass. [Vol.70,p.756]

The method of hardening high-speed steel developed by the above company is reported to be a new process. The equipment consists of blocks of carbonaceous material somewhat resembling graphite. These blocks are pierced to receive tools of different shapes. Tools of a round or square cross-section are hardened best in a round hole not very much larger

in size than their own. The reason for this is that the blocks gradually gasify, and thus prevent oxygen from attacking the steel. The material used in the blocks will not attack either the furnace or the steel. The results secured by the process have shown perfect hardening without variation and the parts have come out clean with sharp corners.

The block is protected in the furnace by a silicon-carbide muffle, which prevents the outside from wearing away. The muffle and blocks will satisfactorily withstand a temperature that will melt the corners of the steel placed in them. Production depends upon the application, of course, but a production of 4,000 ¼-in. taps per days is reported using two No. 1 blocks. The blocks and muffles will be furnished in a variety of standard sizes, and special sizes will be furnished where desired.

— 184 —

Pyrometer, Radiation, Pocket, K & S

Colonial Supply Co., 217 Water St., Pittsburgh, Pa. [Vol.70,p.494]

All working parts of this pyrometer are completely inclosed and protected in a dust-proof housing. The overall dimensions are 6 in. long and 2 in. in diam., the weight being only 6 oz. Ten scale ranges are available, five being 1,100-2,600, to 1,100-4,000 deg. F., and the other five, 600-1,400 to 600-2,200 deg. Centigrade.

The principle on which this pyrometer operates is the measurement of the total ra-

diant energy emitted by the hot body, whose temperature is to be determined. The scale is transparent and can be seen at the same time the glowing surface is viewed through the occular. To protect the eye against the bright rays, a red glass is provided. The instrument has a distance factor of about 12, which means that the distance from the instrument to the furnace opening or piece of material whose temperature is to be measured should not be more than twelve times the diameter of the opening or piece.

— 185 —

Pyrometer, Type FD

Roller-Smith Co., 233 Broadway, New York, N. Y. [Vol. 70,p.915]

For checking the temperature of molten white metals, the type FD pyrometer has been placed on the market. It is to be mounted on a support in plain view of the operator. The thermocouple element is incased in a heavy iron cylinder, and the scale is legible at a distance of 12 feet.

The instrument consists of a sturdy D'Arsonval-type millivoltmeter, calibrated to read

temperature degrees from 0 to 1,200 deg. F. It is marked at 20 deg. divisions. The instrument is automatically compensated for changes in temperature by means of a thermostatically-operated magnetic shunt operating on the instrument magnet. It is supplied with a mounting clamp.

Material Handling Equipment

— 186 —

Crane, Traveling, Electric, Type LHR

Box Crane & Hoist Corporation, Janney and E. Ontario Sts., Philadelphia, Pa. [Vol. 70,p.220]

All-steel, arc-welded construction is used for the Type LHR light-capacity crane, which has been designed for buildings with a minimum ceiling height of 10 ft. Material may be stored in the path of operation to a

height within 24 in. of the ceiling. Increased speed, smooth operation, and ease of control are additional features. The crane is built in standardized units for 1-, 2-, and 3-ton loads and in spans up to 50 feet.

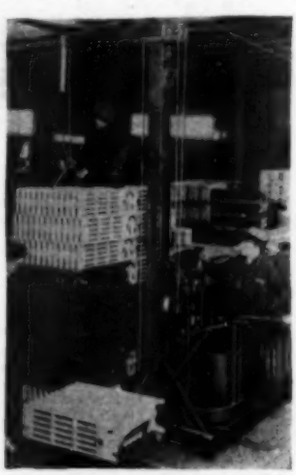
— 187 —

Crane, Revolving, Portable

Lewis-Shepard Co., Watertown Station, Boston, Mass. [Vol.70,p.878]

For the ready handling of cases, crates, bales, castings, and similar items, which it is desirable to stack, this portable revolving crane has been developed. The crane hook takes a load directly from the hand truck or floor, elevates it, and swings it around onto the top of the pile. The machine can be revolved through a full circle and can, therefore, be operated in a minimum of aisle space. Machines are furnished for hand operation or motor drive.

The crane is equipped with a worm-gear drive winch, and



with reversing drum controllers, the motor being protected with a thermal overload relay. Top and bottom limit stops control the crane travel. A dead-man type of control automatically raises the control handle to its neutral position and applies the heavy-duty service brake.

— 188 —

Truck, Lift, "Red Band"

Barrett-Cravens Co., 1328 W. Monroe St., Chicago, Ill. [Vol. 70,p.645]

According to the manufacturer, this "Red Band" truck will give 25 per cent easier lift than previous models, while permitting 50 per cent faster operation. It is of all-steel construction with such features

as a roller-bearing latch catch, spring handle hold-up, Hyatt bearings, and an Alemite lubricating system. A 5-in. turntable has been incorporated in the design and 3-in. king bolts are now used. The frame is made of manganese steel.

— 189 —

Lift Truck, "Red Streak"

Stuebing Cowan Co., Cincinnati, Ohio. [Vol.70,p.1032]

This easy lifting truck of the single lift type has a capacity of 5,000 lb. and is of all steel construction. It has four wheels

mounted on large ball bearings. The operator can raise the load with the steering lever at the side at any point within an arc of 90 deg.

— 190 —

Truck, Die or Tool

Pollard Bros. Manufacturing Co., 4027 N. Tripp Ave., Chicago, Ill. [Vol.70,p.36]

Heavy dies or tools can be moved about the shop on this truck, which has a height from the floor of 35 in. The trays have sufficient strength to carry loads up to 800 lb. The casters

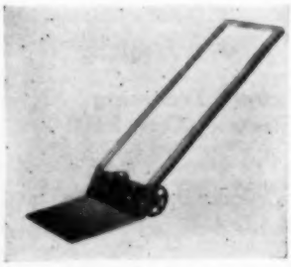
used are of steel and have three rows of ball bearings in the swivel and a take-up for wear.

— 191 —

Truck, Pick-Up

Pollard Brothers Manufacturing Co., 4034 N. Tripp Ave., Chicago, Ill. [Vol.70,p.301]

One standard size of this pick-up truck is manufactured. By pushing the truck under the load and exerting a moderate pressure on the handles, a load may be picked up ready for transportation to any point. The load is carried directly on the wheels and so cannot fatigue the operator, as would happen if the part of the load had to be



sustained by the handles. The wheels are 6 in. in diam. and may be furnished in plain semi-steel or rubber tired. The forks are steel, the handle is of angle iron, and the platform is of steel plate beveled at the edge. It is 14 in. deep by 16 in. wide.

Weight 25 pounds.

— 192 —

Truck, Shop, Roller-Bearing-Equipped

Pittsburgh Producers Supply Co., Pittsburgh, Pa. [Vol.70, p.646]

Although primarily designed for use as a nail buggy, this truck is suitable for transporting heavy loose material in bulk,

such as machine tool turnings and small castings. It has a rated capacity of 1,500 to 2,000 lb., and the dimensions are 36 in. long, 24 in. wide and 24 in. deep at the deepest point. It is mounted on two 30-in. wheels and one 8-in. pilot wheel.

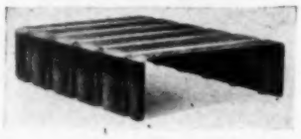
Both the wheels and the body of this truck are made entirely from steel sections welded together. Each wheel is mounted on two Timken bearings, arranged to withstand thrust loads. One man can handle the truck with ease.

— 193 —

Skid Platforms, Pressed-Steel, Corrugated

Lewis-Shepard Co., 171 Walnut St., Boston, Mass. [Vol. 70,p.952]

These pressed-steel skid platforms are available in a number of special and standard sizes and gages. Removable stock boxes have been provided for use on the platforms when transporting loose materials and small



units. These stock boxes may be permanently attached to the platforms by welding. The boxes may also be provided with corrugated bottoms for use without platforms. Interior tiering angles are riveted to the inside of the leg of the standard skid platforms to facilitate storing.

The platforms are made of one-piece sheet steel with deep ribs and corrugations for rigidity and act as supporting girders. A rib and shoulder crimp keeps the legs from spreading and buckling. Special knee braces may be riveted at each corner.

— 194 —

Capstan, Vertical

Lidgerwood Manufacturing Co., Elizabeth, N. J. [Vol.70, p.840]

Compactness in design reduces the space requirements of this "Tugmore" capstan to 25x34 in. It is used for moving freight cars. The unit is made in two standard types, and is available

from stock in five sizes: 5½-hp. a.c., and 5- and 7½-hp. d.c. electric models, and 6- and 8-hp. twin-cylinder air-cooled, engine-driven types, using gasoline or kerosene for fuel. The capstans have anti-friction bearings running in oil and both electric and engine-driven types are of weather-tight construction.

Woodworking Equipment

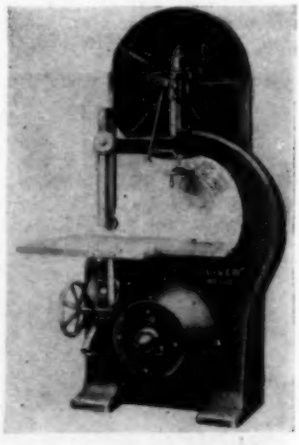
— 195 —

Bandsaw, High-Speed, 36-Inch, No. 116

Oliver Machinery Co., Grand Rapids, Mich. [Vol.70,p.758]

Capacity to cut work up to 22 in. under the guide and 36 in. between the saw and the column is available in the No. 116, high-speed bandsaw, which is furnished with a tilting table for a 45-deg. tilt in one direction, and a 7 deg. tilt in the other in order to take care of draft in the pattern. Speeds of 750 or 900 r.p.m. may be obtained as standard, with other speeds up to 1,200 r.p.m. available.

The lower disk wheel is driven directly by the motor, which is of the fully-inclosed, built-in type. Other types of drives furnished are: Belted, geared, coupled, silent chain, and from a motor slung at the rear. The disk wheels employed are 36 in. in diam. The upper wheel has a vertical adjustment of 9 in. and may be tilted for tracking the blade. The shafts are made of special spindle



steel, ground and tapered. Both shafts run on ball bearings. The machine is provided with indicator fingers to show the tension of the saw. The saw blade runs fully-inclosed in a metal guard.

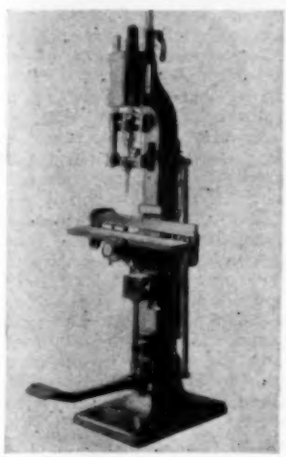
Floor space, 30x50 in., hp. from 3 to 5, according to the work. Weight, crated, for motor-on-shaft bandsaw, right-hand, 2,500 lb. net.

— 196 —

Mortiser, Ball Bearing

A. V. Edwards, 16 Broad Terrace, Bloomfield, N. J. [Vol. 70,p.185]

Chisels up to ¾ in. square and boring bits up to 1¼ in. in diam. can be carried in the Almond chuck of this mortiser. The spindle runs at 3,600 r.p.m. and is driven by a ¾-hp. motor. It is mounted on SKF ball bearings. The bit has a travel of 4 in., and the work table may be raised or lowered by a quick-acting hand-wheel through 15 in. A depth stop is supplied, and also means



for adjusting the length of the bit in relation to the chisel.

When operating the work remains stationary, being held by a screw-clamp, and the chisel and bit are moved down into the work by means of a treadle. The table is 6x24 in., and is equipped with stops. The travel is 6 in. each side of the center. The table also has a screw adjustment of 4 in. in and out and may be tilted through an angle of 45 deg., either side. A plain table may be supplied.

— 197 —

Sawing Machine, Electric, "Junior Wonder Worker"

De Walt Products Corporation, Leola, Lancaster Co., Pa. [Vol.70,p.338]

A smaller model of the "Wonder Worker" woodworking machine known as the "Junior" has been placed on the market. This machine will rip 2-in. stock at the rate of 20 ft. per min., when equipped with a 12-in. combination cross-cut and

rip saw. Features include easy adjustment to any position, ability to change from cross-cutting to ripping without stopping the motor, and an accurate ripping gage and dials for adjustment to any position. The unit is driven by a universal motor.

This woodworking machine is fitted onto a wooden table 29 in. wide by 59 in. long, and all work can be handled from one side, with the cross-cutting, ripping, shaping and layout marks always in plain view. This combination of table and machine is compact, and can be carried by two men. Standard equipment includes an adjustable guard that fits down on the work and gives positive protection to the operator. Weight 235 lb. complete.

— 198 —

Saw Bench, Motor-Driven, Arbor, No. 191

Oliver Machinery Co., Grand Rapids, Mich. [Vol.70,p.528]

Like the larger models announced on page 238, Vol. 68, of the *American Machinist*, the worktable of this No. 191 motor-driven circular saw bench re-

mains stationary while the arbor is tilted to any angle up to 45 deg., to enable the operator to rip, cross-cut, miter or dado while the work remains flat on the horizontal table. The machine is portable and operates from the light socket. It will cut 2 in. deep with a standard 7-in. saw, or 2½ in. deep with an 8-in. saw.

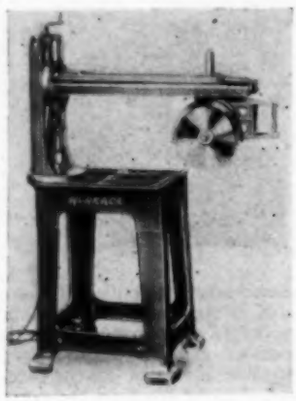
A graduated scale at the front of the machine shows the angle of inclination to which the saw is tilted. The saw may be raised or lowered for changing the depth of cut. The machine is ball-bearing equipped throughout. An area of 25x30 in. is provided on the table.

— 199 —

Saw, Radial, "Workace"

J. D. Wallace & Co., 134 S. California Ave., Chicago, Ill. [Vol.70,p.911]

This saw is easily adjusted to cut at any angle for cross-cutting or ripping, dadoing or grooving, rabbeting, routing,



shaping and sanding. It is also well adapted for straight cut-off work.

The saw and motor unit are mounted on a turntable 6 in. in diam., which, in turn, is mounted on two heavy steel rods placed 5 in. apart to prevent spring. These rods are carried in a radial arm mounted in the pedestal on a turntable 10 in. in diam., permitting the arm to be set in any position. The pedestal is also mounted on a turntable 10 in. in diam. By means of these three turntables, the saw can be placed in any position for any kind of cutting.

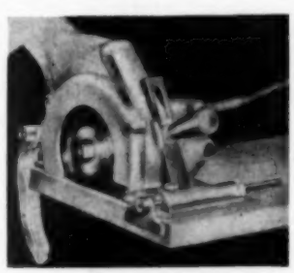
With an 8-in. blade, the machine will cut 2½ in. deep, and with a 9-in. blade, 3 in. deep. Saw travel is 19½ in. in the arm, vertical adjustment 5¾ in. The motor is of the universal type and has ball bearings.

— 200 —

Saw, Portable

Porter-Cable Machine Co., Syracuse, N. Y. [Vol.70,p.186]

This portable power-driven circular saw is intended for the pattern shop, the shipping room, and the plant carpenter. The saw is 6 in. in diam., and is mounted directly on the armature shaft, which runs in precision ball bearings, packed in grease. It will cut up 1⅜-in. lumber, but weighs only 10¾ lb.,



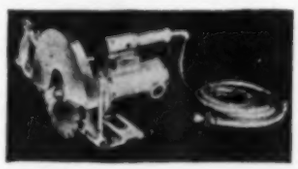
and is operated easily with one hand. A gage is provided and also a depth adjustment for the saw, when used in cutting dados, slots, or removing flooring. The guard protects the saw and the operator when not in use. In the case of double flooring the saw can be set to cut through only the upper one, or the finish floor.

— 201 —

Handsaw, Electric, "Howland"

Electric Hand Saw Co., Seattle, Wash. [Vol.70,p.835]

The "Howland" electric handsaw is a circular saw driven by a 0.4-hp. motor and mounted on a flexible frame. The saw may be used for either ripping or cross-cutting. It is possible to use the saw either free hand or with a miter box or saw table.



A miter square and ripping guide are supplied.

The circular saw is 6¾ in. in diam., and has a free running speed of 2,700 r.p.m. The frame and saw guard are made of aluminum, as is the frame of the motor, which is a Westinghouse universal type for use on either d.c. or a.c. circuits, at voltages of 110 or 220. The armature is statically and dynamically balanced, and the windings are specially treated and processed to resist the abrasive and chemical action of the sawdust.

The motor is equipped with a built-in automatic thermostat that shuts off the motor when it gets dangerously hot, and turns it on again when it cools sufficiently for safe operation.

— 202 —

Handsaws, Electric

Black & Decker Manufacturing Co., Towson, Md. [Vol. 70,p.877]

These three electric handsaws to carry 6-, 8-, and 10-in. saws, respectively, will cross-cut and rip lumber up to 3½ in. thick, and, in addition, can be used with a special metal-cutting saw. The saw blade is inclosed in a telescopic guard so that as the saw progresses the guard automatically telescopes, but snaps back into place after the cut is finished. An adjustable shoe can be set to cut any depth up to the capacity, and it maintains the angle throughout the cut.

These units are provided with universal motors and they are

equipped with pistol-grips and trigger switches. Ball bearings are used throughout and the gears and shafts are made of chrome-nickel steel. Gears run in grease-tight compartments.

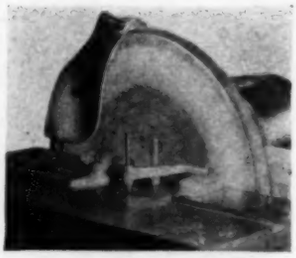
The machines are air-cooled and will operate continuously without over-heating. Standard equipment consists of one rip and one cross-cut saw, one adjustable saw fence, and a case. Units are furnished for 32-, 110-, 220-, and 250-volt circuits.

— 203 —

Sanding Attachment, Pattern Shop, Core Print Gage

Porter Cable Machine Co., Syracuse, N. Y. [Vol.70,p.220]

Core prints, bosses, and taper work can be obtained ten to twenty times faster by means of this gage than when turned on a lathe, according to the manufacturer. The pattern is visible at all times, so that it is easy to follow a line. The gage consists of a base which slides in the slot on the table, a stop arm and



thumb screw which lock the stop arm in place, and a radius arm having a piercing point at its extreme end. After the circular line is drawn on the piece, the piercing point on the radius arm is placed in the center of the circular arm, the work placed against the disk and the pattern sanded to the line. The size of work that is practical to sand face on this gage is from ¼ to 5 in. in diam. and up to 2 in. in height.

Balancing, Gaging, and Testing Equipment

— 204 —

Balancing Equipment, Portable

Electrocon Corporation, 6 Varick St., New York, N. Y. [Vol. 70, p.377]

By means of the stroboscopic principle, apparatus known as the Davey Dynamic Balancing Eqiupment, which weighs only 20 lb., can be used for determining separately the static and dynamic unbalance existing in machines ranging in size from turbines down to fractional-horsepower motors and correcting both types of unbalance in turn. The apparatus is manufactured by the above company under the patents of Vibroscope, Incorporated.

The performance of the equip-

ment can be summarized as follows: Accurate and dependable "high spot" indications regardless of condition of the shaft; convenient readings of the amount of vibration, fractional parts of 0.001 in. being ascertained easily; a quick method of determining the condition of unbalance in the first run; separate identification of static and dynamic unbalance, and separate correction, and determination of the angle of lag between the high spot and the heavy spot that causes the vibration.

The phase adjuster head, shown in the center of the illustration, co-ordinates the light flashes of a hand neon lamp and a neon lamp within the "Vibrometer" or vibration measuring device at the right. The vibration of the machine causes a band of light to be thrown on a screen in the Vibrometer, and a neon flash impinging on this light band shows the position of the machine in its swing with relation to the angular position of the rotor. Both the amount and direction of the vibration can be measured, the angle of lag ascertained, and the static and dynamic unbalance corrected.

— 205 —

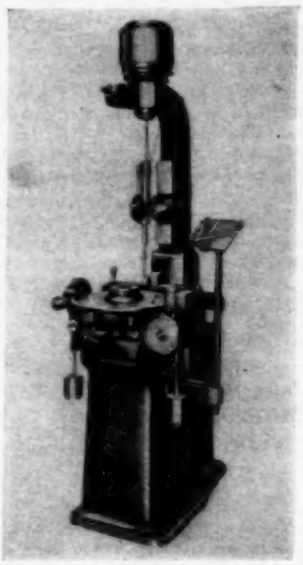
Balancer, Static, Improved

Gisholt Machine Co., Madison, Wis. [Vol.70,p.835]

From 35 to 40 pieces per hour can be balanced and corrected as regular production on this improved static balancer. The machine, which is built in 18-, 24-, and 36-in. sizes, was previously described on page 558, Vol. 68, of the *American Machinist*. It is suitable for balancing flywheels, clutches, and other narrow-faced parts. Unbalance within two-tenths of an ounce-inch can be detected.

Improvements consist of suspended pivots replacing the former knife type; positive spindle alignment with the pivot axis, assuring continuous operation without adjustment; a chip collector and chute that deposits the material drilled from the work in a convenient place; and greater accuracy.

The part to be balanced is mounted with its axis in a vertical position on an adapter which is carried on a cradle suspended from two special pivots. The



machine is supplied with two attachments, a "Cutmeter" and a protractor scale which enable the operator to locate the unbalance and correct it by drilling holes to the depth indicated in the required locations.

Where desired, the static balancer can be furnished with a belt-driven spindle or by direct motor drive.

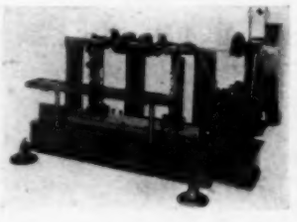
Net weights of the 18-, 24-, and 36-in. sizes with motor-driven spindles are 1,770, 1,840, and 1,965 lb., respectively.

— 206 —

Balancing Machine, Dynamic, Centrifugal, Improved, Olsen-Lundgren

Tinius-Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.70,p.877]

Several improvements have been made in the Olsen-Lundgren centrifugal dynamic balancing machine illustrated on page 906, Vol. 68, of the *American Machinist*. Both ball and roller bearings have been abandoned as experience has shown that for this particular case the plain bearing gives greater sensitivity, accuracy, and reliability. The weights used in the former machine have been replaced by



calibrated springs that are controlled by micrometer graduated barrels at each bearing of the shaft. In this way, pressure due to unbalance is indicated directly in ounce-inches.

The improved design makes it easy to control the motion due to centrifugal forces of the unbalanced weight whereby the average of the total unbalance is obtained, as the support is free to oscillate in one direction only when the pressure readings are taken, but is free to operate in two opposite directions when the angle is taken. A substantial double-column has replaced the single column support formerly used.

When balancing parts in large quantities, charts are prepared to show the operator all the necessary information. These charts take the place of the transfer instrument that was illustrated in connection with the previous machine. The transfer instrument, however, is provided for use when desired.

The couplings, incorporating a ball-bearing universal joint, which compensates for any ordinary misalignment between the spindle and the piece being tested, is retained. The quick-locking mechanism that facilitates the reading of the unbalance in either bearing is also found as a feature in the improved design.

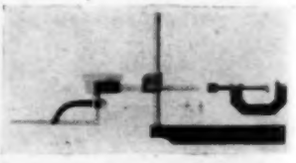
— 207 —

Indicator Set, Dial, No. 740

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.452]

All types of testing, setting up, and inspection of machine work can be done with a No. 740 dial indicator set, which can be adjusted to almost any position, and which can be used in narrow places and holes. The dial is 1⅛ in. in diam. The device can be used on a universal surface gage, and is easily adjusted for use on the toolpost of a lathe, a planer tool, and a milling machine arbor.

Long life and accuracy of the



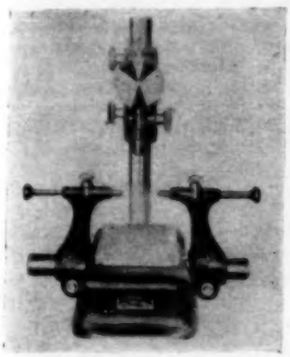
set is assured by the fact that the helical cam has four sections and may be turned to bring a new section into play, if wear or accident should impair the accuracy. The dial is graduated in thousandths, a range of ⅛ in. being provided on either side of zero. The device consists of a dial indicator with hole attachment bar with upright rod, slide with indicator rod, and three chromium-plated contact points.

— 208 —

Comparator, Dial, Direct-Reading

Federal Products Corporation, Providence, R. I. [Vol.70,p.915]

Graduations on this direct-reading dial comparator are $\frac{1}{16}$ in. apart, equalling a measurement of 0.001 in. The device has means for coarse and fine adjustment on the head, and will take objects up to 8 in. in diam. underneath the stem of the dial gage. The platen has an area of $4\frac{3}{4}$x6 in., the longest dimension being toward the post.



The comparator may be furnished with V-blocks having hardened and ground rollers, $7\frac{1}{2}$ in. long, and held by heavy supporting brackets carried on a shaft passed through a hole in the base. Weight, without blocks, is 17 pounds.

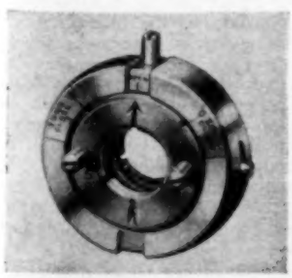
— 209 —

Gage, Thread, "Hartometer"

Jones & Lamson Machine Co., Springfield, Vt. [Vol.70, p.184]

A new step in thread gaging is claimed for the "Hartometer" screw-thread gage, of which the outstanding advantages are: Completeness in one simple unit, doing away with the need for separate Go and No Go gages, and rapid accurate measurement of both the lead and pitch diameter.

The principle of the gage is that of two nuts meeting together on a screw with a definite means of measuring the angle of contact or matched points on the faces of the nuts. If the lead and pitch diameter of the thread of the screw mates exactly with the thread of the nuts, the predetermined points will coincide, but if either the lead or the pitch diameter of the screw is off, the matching points will fall short or over a definite amount in proportion to the error. On a screw of correct lead, the travel to the right and to the left will be equal. A screw, on which the indicator has a greater travel to the right than to the left, has a longer lead than standard. A screw, on which the indicator has a greater travel to the left, has a short lead.



The dial plates furnished are graduated with limits corresponding to standard class tolerances, but they may also be obtained with graduations showing the percentage of basic thread, which in turn corresponds to the percentage of shearing strength.

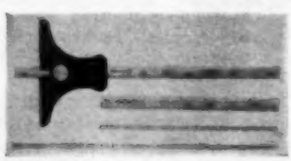
The gage is set with a standard screw plug to obtain the zero or base line on the dial plates. The gage is made regularly in sizes from $\frac{3}{8}$ to $\frac{3}{4}$ in., National Commission Standards, fine and coarse series. The thickness of each gage is equal to the thickness of a standard nut of that size.

— 210 —

Gage, Depth, Rule

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.222]

Measuring the depths of small holes can be done by means of this rule depth gage, which is so designed that it can be used with a 4- or a 6-in. rule or with a $\frac{3}{4}$-in. rod. The blade of the 4-in. rule depth gage is furnished with the No. 10 graduation and the 6-in. size with either the No. 10 or the No. 11



graduation, English measure. The metric blade is graduated in millimeters and half-millimeters. The rod or rule is locked conveniently at any reading by the knurled nut on the base. This rule depth gage is furnished with a 4-in. rule, with or without a rod 4 in. long, or with a 6-in. rule, with or without a rod 6 in. long.

— 211 —

Gage, Depth, Rule, No. 616

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.566]

This gage has the additional feature of an easily adjusted protractor. The blade may be locked easily at any angle in

relation to the head by the larger of two clamp nuts on the front side. The turret is graduated in 10 deg. units from 0 to 90 deg. inclusive. A smaller clamp nut on the front side of the head locks the blade for use as a depth gage. The 6-in. blade is graduated in 32nds and 64ths, or in millimeters and half-millimeters.

— 212 —

Gages, Radius

Lufkin Rule Co., Saginaw, Mich. [Vol.70,p.1031]

This radius gage set consists of 16 individual gages from $\frac{1}{32}$ to $\frac{7}{8}$ in. radii by 64ths, all contained in a leatherette folder. Each radius is an individual

gage, thus allowing the mechanic to select the particular radius he desires and have it continually available. Both external and internal forms are on the same gage.

— 213 —

Thickness Gage Stock, No. 666

L. S. Starrett Co., Athol, Mass. [Vol.70,p.952]

This thickness gage stock comes in 25-ft. rolls, $\frac{1}{2}$ in. wide, and in thicknesses from 0.0015 to 0.15 in., packed in a metal

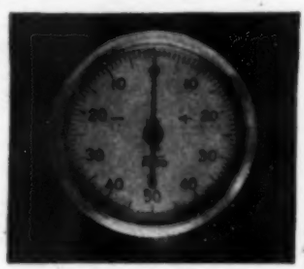
case. The stock is spring tempered to insure accuracy and dependability and is marked every 6 in. with a line and the thickness. It is used in a No. 806 thickness holder shown at the left hand of the accompanying illustration. This holder will take any thickness from zero to 0.025 in., and by its use prevents abrasions to the workmen's hands.

— 214 —

Indicator, Dial, Model 80, Jr.

Federal Products Corporation, Providence, R. I. [Vol.70,p.570]

A range of 0.200 in. is available in the Model 80, Jr. dial indicator. The diameter is $1\frac{33}{64}$ in., and the holding bar is



$2\frac{1}{2}$ in. long by $\frac{1}{4}$ in. in diam. With regard to the interior construction, the four main bearings are jeweled, the racks are chromium plated, and the movement is a separate unit, insuring positive alignment.

— 215 —

Testing Machine, Ductility, Motor-Driven, Nos. 2A and 3

Tinius Olsen Testing Machine Co., 500 North 12th Street, Philadelphia, Pa. [Vol. 70,p.532]

Determination of the drawing qualities of sheet metal can be done accurately and rapidly on the Nos. 2A and 3, improved, motor-driven ductility testing machines. Both of these units are automatic in operation, the No. 2A testing sheet stock up to $\frac{1}{8}$ in. in thickness and the No. 3 up to $\frac{1}{4}$ inch.

Whereas the travel on the cupping tool on the No. 2A machine must be started by tripping the proper control, on the No. 3 the cupping tool returns automatically to the original position. On both machines the trip may be arranged so as to control the amount of travel in each direction automatically. Both machines are driven by fractional-horsepower universal motors. The cupping of the sample is measured to a

thousandth of an inch. Pressure is measured to a total of 12,000 lb. on the No. 2A and to 35,000 lb. on the No. 3 machine.

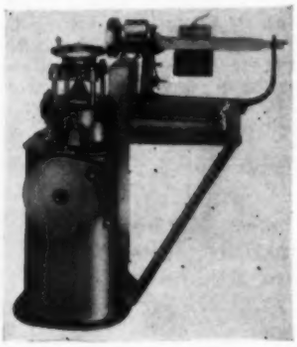
On the Nos. 2A and 3 machines, respectively, the lengths are 20 in. and 2 ft. 6 in., widths 28 in. and 2 ft., and heights 28 in. and 2 ft. 6 in. Weights, 425 and 670 pounds.

— 216 —

Testing Machine, Ductility, Lever-Weighing

Tinius Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.70,p.570]

Measurement of the load during tests can be made on this screw-power, sheet-metal, ductility testing machine by means of a lever weighing construction. The machine illustrated is arranged for manual operation, and is equipped with a dial vernier screw beam. When desired, however, it may be obtained with either an automatic



beam or an automatic and autographic attachment, showing graphically the relation between the pressure and the depth of cupping. The mechanism for producing the cup in the sheet metal and the method of operation are similar to those employed in the No. 2A machine described elsewhere in this issue.

This lever-weighing ductility testing machine is available in five sizes, having capacities of 10,000 to 50,000 lb., respectively. The dimensions range from 4 ft. to 4 ft. 9 in. in length, 2 ft. to 3 ft. 4 in. in width, and 3 ft. 4 in. to 3 ft. 9 in. in height. Weights range from 980 to 1,820 pounds.

— 217 —

Testing Machine, Spring, "Elasticometer," No. R-25

Coats Machine Tool Co., Inc., 110 West 40th St., New York, N. Y. [Vol.70,p.950]

For testing small highly-sensitive springs with accuracy and under mass production methods at low cost, the No. R-25 "Elasticometer" spring testing machine can be used for tension and compression springs under loads from ½ oz.

up to 56 lb. The weighing mechanism located in the upper housing has a 1 to 10 leverage. Drive is through a screw spindle and handwheel located in the lower housing. Strength of the spring is determined by placing loose weights on the hook of the weighbeam. The scale attached to the right supporting pillar is graduated in $\frac{1}{32}$-in. divisions and indicates length of spring, open, compressed or elongated. Tolerance markers arranged alongside of this scale facilitate quantity inspection.

Centering or guide pins may be inserted in the lower compression plate for preventing small compression springs from buckling over. The tension hook for tension springs is located to the left of the upper compression plate.

Specifications: Maximum distance between compression plates and tension hooks, 4 in.; maximum spring diameter tested, approximately 2¾ in.; space requirements, 16x17x6 in.; weight, 45 pounds.

— 218 —

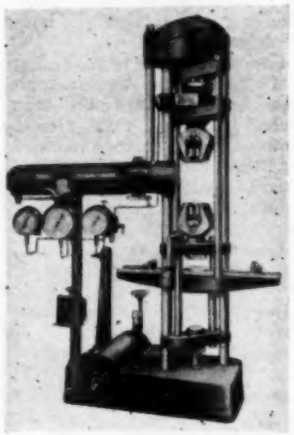
Testing Machines, Universal and Plain

Alfred Suter, 200 Fifth Ave., New York, N. Y. [Vol.70,p. 1028]

Several universal and plain testing machines built in capacities from 15 to 1,000 tons have been placed on the market in this country by the above representative of the Losenhausenwerk Dusseldorfer Maschinenbau, A. G., Dusseldorf-Grafenberg, Germany. The universal machines are suitable for tension, compression, folding, shearing, and Brinell tests, whereas the plain units are suitable for tension tests only. Both the universal and plain types are available in three different models: For load measuring by sliding weight balance, by hydraulic gage chamber and Bourdon steel tube pressure gage, and by a combination of the two methods.

All cast parts subjected to heavy strains are of steel. All gripping tools are made of crucible steel. Non-polished and cast parts are finished in baked-on black enamel.

A feature of the universal testing machines is the independence of the various attachments. For tension tests, a pair of rapid gripping heads is used, and by means of these any test rod of standard shape can be gripped in two operations. After the test the head is returned to the original position at 600 ft. per min. Drive of the screws is by motor, various speeds being obtained at the friction clutch. A recording drum is fitted on all units equipped with



the hydraulic load measuring equipment in order to show the amount of elongation and the amount of the load throughout the entire test, including rupture.

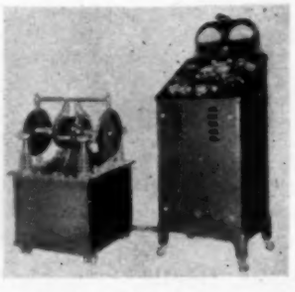
Dimensions of the universal machines for the 15- to 100-ton models are as follows: Width, 58 to 104½ in.; depth,, 26¾ to 59 in.; height, 82¾ to 153½ in., the Model ULM being slightly higher. Weights range from 2,200 to 15,400 pounds.

— 219 —

X-Ray Apparatus, "Keleket"

Kelley-Koett Manufacturing Co., Covington, Ky. [Vol.70,p. 299]

Metal sections up to 3 in. in thickness can be inspected for hidden defects by means of the "Keleket" X-ray apparatus. Such equipment permits the de-



termination of the results of faulty technique in casting, forging or drawing, and permits the development of new methods that will insure uniformly good results. The 140,000 peak-voltage model illustrated is the most suitable for industrial requirements.

X-ray pictures from the maximum of 14x17 in. down to 2x3 in. can be made of the part under inspection. A peak voltage of 140,000 and a working distance up to 7 ft. from the specimen are the working limits of the apparatus described.

The units illustrated are those forming the generator for energizing a universal X-ray tube. The larger cabinet at the right contains the controls while the smaller unit at the left combines the rectifier and transformer, the former being supplied to suit any commercial voltage or frequency. However, the standard model supplied is for 220-volt, 60-cycle circuits.

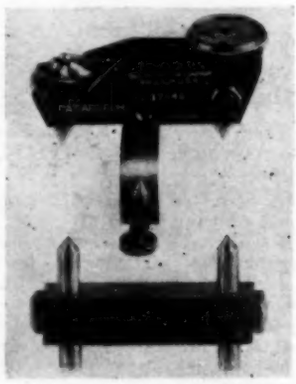
Overall dimensions of the transformer rectifier unit are 21 in. wide by 22 in. deep, by 32 in. high, and the control unit is 20 in. wide, 21 in. deep, by 54 in. high. Weights, 585 and 225 lb., respectively.

— 220 —

Extensometer, Strain-Gage, "Olsen-Lewis"

Tinius Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.70,p.565]

Determination of the stresses in machines, as well as in test specimens can be made by means of the "Olsen-Lewis" strain-gage extensometer. The instrument can be used in the usual way on the standard 0.505-in. test specimen, using a



2 in. gage length. Inertia reactions have a minimum distorting effect on the dial readings, according to the manufacturer, thus assuring accurate readings whenever it is necessary to secure knowledge of suddenly applied or intermittent loads on support members. For example, the device may be set up on the frame of a punch press. The instrument is packed in a case.

When the instrument is set up with the pins in punch marks, each mark on the dial indicates 0.000066 in; when used in $\frac{1}{16}$-in drilled holes, each mark indicates 0.00006 in. The lever combination is so located with reference to the dial and gaged length that the instrument gives accurate indications regardless of position.

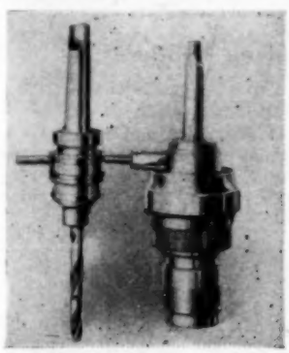
Small Tools

— 221 —

Chucks and Collets, Quick-Change, Style P

Charles L. Jarvis Co., Gildersleeve, Conn. [Vol.70,p.225]

Where operations such as drilling, reaming, counterboring, spot facing, and tapping are required in one setting of the casting, these quick-change collets and chucks can be used to advantage on a radial drill or an ordinary drilling machine. A common engine lathe can be converted into a turret lathe by means of these devices, a spring being placed in the back of the lock-



ing ring on them to hold them locked in the horizontal position in the machine.

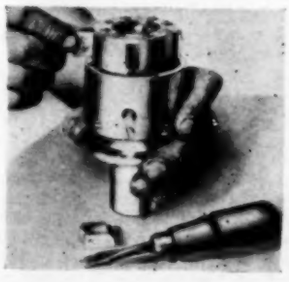
The collets can be changed quickly with one hand. They are made short, thus bringing the chuck nearer the work, while holding the tool rigidly. The collets are made of drop forgings, hardened and ground, and are available in all standard drill and tap sizes. The chucks are made in four sizes known as Nos. 2, 2½, 3, and 4, their largest diameters being 2, 2⅜, 3, and 4 5/16 in., respectively. Driving is accomplished by means of lugs placed near the work.

— 222 —

Dieheads, Opening, "Namco"

National Acme Co., Cleveland, Ohio. [Vol.70,p.300]

This style CR revolving-type opening die permits the chasers to be removed almost instantaneously without removing the tool from the machine. The chasers are held from



dropping out when in the released condition by means of a brake shoe arrangement. There are only three parts in the tool. The dies are hardened and ground throughout, and the opening in front of them has been made as large as possible to permit close-to-shoulder threading on ordinary standard screws. The dies are made in 7/16-, 5/8-, 11/16-, 1-, and 1⅛-in. capacities.

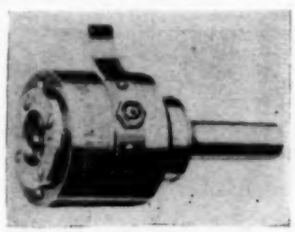
— 223 —

Dieheads, Screw-Machine, Types P & G

Murchey Machine & Tool Co., Detroit, Mich. [Vol.70,p.718]

The type P non-rotating diehead is designed for use with the Nos. 0 and 2 Brown & Sharpe automatic screw machines. The chasers used are interchangeable on both types P and G and also on types O and CO dieheads, making only one set necessary for both spindle and turret work on the machine.

Both the types P and G dieheads are arranged to close by



cam action through a rotary motion of the shell actuated by the closing arm, which engages a trip on the bed of the machine. The device is adjustable for thread length and opens automatically when the thread is cut. Another feature is that it is possible to remove the chasers without taking off the cap of the device.

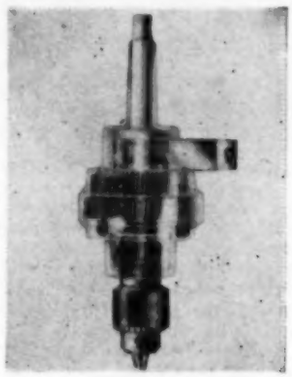
The type P diehead is manufactured in 7/16-, 5/8-, and 1-in. sizes only. The type G is made in the same sizes and also in 1¼-, 1½-, and 2-in. sizes, and thence up to 5 in. by steps of ½ in. Both types are adapted to any non-rotating, single-spindle, threading machine of the automatic type.

— 224 —

Tapping Head, "Midget"

Chas. L. Jarvis Co., Gildersleeve, Conn. [Vol.70,p.189]

The prevention of broken taps and stripped or distorted threads is claimed for this device, which may be used on any drilling machine. The features include ball bearings, a friction reverse, and a friction drive. Holes up to 5/8 in. can be tapped in steel and up to ¾ in. in cast iron. The



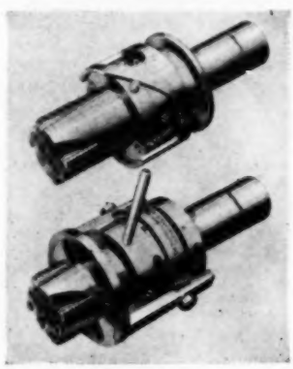
operating speed is 2,500 r.p.m. Size overall is 4¾ in. and the diameter is 2¼ in. Weight, less than 3 pounds.

— 225 —

Taps, Collapsing, Styles CR and CS, "Namco"

National Acme Co., Cleveland, Ohio. [Vol.70,p.300]

Two styles of this collapsing tap are available, the first known as the CR, being of the revolving type, while Style CS is of the stationary type. The chief feature of these tools is the fact that the chasers can be removed almost instantaneously without removing the tools from the machine. The collapsing taps have positive cam action for collapsing the chasers, and this mechanism prevents the chasers



from tipping, thereby eliminating tapered threads.

The design of both of these tools is such that no chips or dirt can find their way into the interior and particles can be blown off the exterior by means of compressed air. Both collapsing taps are available in similar size ranges, the sizes being 2¼, 2⅝, 3¼, 3⅝, 4¼ and 4⅝ in., respectively.

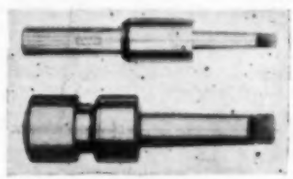
— 226 —

Toolholder, Full-Floating

Apex Machine Co., Dayton, Ohio. [Vol.70,p.531]

This full-floating toolholder permits the tool to enter the work on a straight line when the machine spindle and the work do not line up, but their axes are parallel. The device is ball bearing equipped and has a total movement of 1/16 in., or 1/32 in. each side of center. It is furnished with either straight or Morse taper shanks, and with a bottom to take straight shank tools, Morse taper shank tools, or the Apex quick-change drill chuck.

A full-floating, self-aligning toolholder for use on single- or



multiple-spindle operations will take care of any angular irregularity between the tool or the work, and also allow the tool to float parallel to the axis of the rotating part. The floating parts are ball bearing equipped and the angular alignment is adjustable. The tool is furnished in several different sizes.

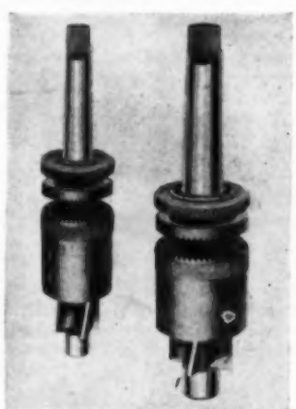
— 227 —

Toolholder, Quick-Adjustable-Collar

Eclipse Interchangeable Counterbore Co., 7410 St. Aubin Ave., Detroit, Mich. [Vol.70, p.1026]

The bushing on this improved stop collar toolholder can be adjusted by hand. The device is recommended for use as a holder when counterboring, spotfacing, countersinking or core drilling to a specified length. The adjustable collar stops against the top of the fixture bushing or against the work being machined, and regulates the depth of the cut.

Quick hand adjustment of the



collar up or down may be accomplished by backing off the upper lock nut, lifting the drive washer, and turning the stop collar to the desired position, and then lowering the drive collar and turning down the lock-nut. By changing to a straight

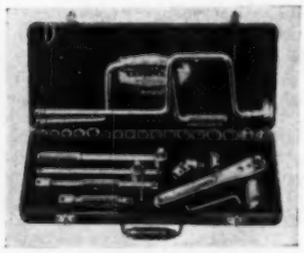
shank, the holder may be used for tools in turret lathes. It is furnished in all standard sizes for use with Eclipse standard and special counterbores, core drills, and other tools.

— 228 —

Wrench Sets, Socket, "Chief"

Blackhawk Manufacturing Co., Milwaukee, Wis. [Vol.70, p.337]

These three sets of socket wrenches have the following features: Double hexagon sockets of chrome-vanadium steel that are quickly detachable, chromium plating, and metal cases. They are an addition to the line manufactured by the



above company and do not replace present sets or tools in the regular black enamel finish.

Set 30 CD, illustrated, contains 30 handles, attachments and sockets. The No. 16 CD contains 16 tools, and the No. 26 KD combines the 16 CD and ten "Blackhawk - Armstrong" open-end wrenches. Six of these wrenches are of the engineer's pattern while the remainder are of the tappet type.

— 229 —

Wrench Set, Box, Double-End, No. 33

Bonney Forge & Tool Works, Allentown, Pa. [Vol.70,p.646]

This set of double-end box wrenches known as the No. 33 contains nine wrenches with openings from $\frac{7}{16}$ to $\frac{1}{8}$ in. The

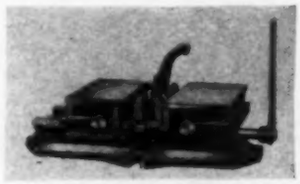
tools are made with double hexagon openings are thin and light in weight, and are particularly useful for work in close quarters.

— 230 —

Vises, "Berjo"

Avey Drilling Machine Co., Cincinnati, Ohio. [Vol.70,p.36]

The "Berjo" vise is used in holding pieces of irregular shape. It is made in either bench or machine types. The



vise has two jaw carriers, one fixed and the other movable. The jaws themselves are narrow steel plates that slide in and out in the carrier. The space back of the jaws is filled with steel balls that act much like a fluid when pressure is applied, and thus permit the jaws to assume the shape of the piece to be held. Movement of the carriers does not change the contour taken by the jaws.

The machine vises are made in three sizes with maximum openings between the jaws of 4, 6, and 9 in., respectively. The widths are 3, 4, and 6 in., and the depths of opening are $1\frac{1}{16}$, $1\frac{1}{8}$, and $2\frac{7}{16}$ in., respectively. The bench vise is made in two sizes and has jaw openings of 4 and 6 in., widths of 7 and 8 in., and depths of $1\frac{1}{16}$ in. and $1\frac{1}{8}$ in., respectively.

— 231 —

Vise, Pipe, Chain-Type, "Vulcan Superior"

J. H. Williams & Co., Buffalo, N. Y. [Vol.70,p.189]

The handle of this vise is always on top, where it is easy to operate, and the reversible jaws insure longer life, because they can be reversed by simply unscrewing the bolts. The parts are made of drop-forged steel.

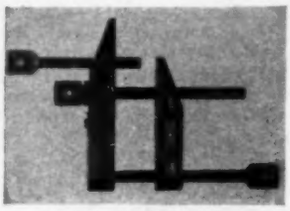
The chain is the same as used in the "Vulcan" chain pipe tongs. It is unbreakable, compact, and positive in grip. The device is finished with chromium plating, and is furnished in two sizes for $\frac{1}{8}$- to $2\frac{1}{2}$- and $\frac{1}{4}$- to $4\frac{1}{2}$-in. pipe, respectively.

— 232 —

Clamp, Toolmakers', No. 756

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.299]

The auxiliary screw and the longer jaw give the clamp extra support and rigidity and prevent slipping of pieces that ordinarily cannot be held between the even-length jaws of plain clamps. The spring attachment on the adjusting screw holds the loose jaw in position at all times. The jaws are rounded on the ends to allow clamping under a shoulder. The No. 756 clamp can be used with any B. & S.



V- or handy block. The device is made in two sizes, the jaw openings being 2 and $2\frac{1}{2}$ in., respectively.

— 233 —

Compass, Beam, No. 8

Esterbrook Steel Pen Manufacturing Co., Camden, N. J. [Vol.70,p.720]

This low-cost beam compass keeps both needle and lead parallel and vertical. There are only two main parts, the unit post and beam and the slide that holds the lead. The post and beam are made of a zinc alloy and the slide is of German sil-

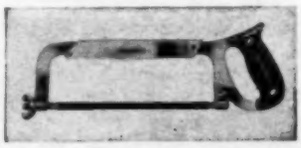
ver. Both are plated. The slide is reversible to make circles up to 8 in. in diam. When it is reversed for large circles, the radius is exactly 2 in. or 5 cm. longer than the scale reading. The scale readings are in inches on one side and centimeters on the other. A regular compass lead is placed in the convenient holder.

— 234 —

Hacksaw Frame, No. 4, "Bon Ton"

Forsberg Manufacturing Co., Bridgeport, Conn. [Vol.70,p. 840]

The No. 4 hacksaw frame is adjustable and uses either an 8- or 12-in. blade. It is claimed to be of exceptionally sturdy



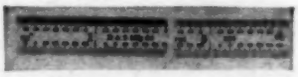
design. The handle is designed particularly to be comfortable to the grip when the saw is used for long periods. The parts are joined by riveting.

— 235 —

Rule, Steel, Flexible, No. 306, Improved

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.70,p.189]

Figured graduations are now placed on both corners of one side of the No. 306 6-in. flexible steel rule. The 32nds are num-



bered every 4th graduation and the 64ths every 8th graduation, thus permitting easier reading on certain classes of work.

— 236 —

Spring Winder

Shaler Co., Waupun, Wis. [Vol.70,p.455]

Both tension and compression springs from the smallest size up to $1\frac{1}{4}$ in. in diam. can be made on the hand spring winder illustrated. These springs can

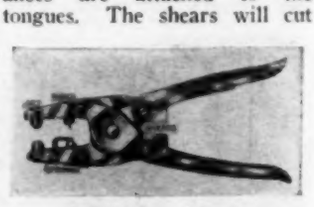
be made in any length, in 2 min., it is claimed, from wire up to $\frac{1}{2}$ in. in diam. A positive space adjustment is provided that may be regulated so that the coils can be spaced accurately up to $\frac{1}{8}$ in. apart. Springs of various diameters are produced by winding them on different size arbors. Material furnished with the gage consists of five arbors and three coils of wire, 0.0041, 0.055, and 0.082 in. in diameter.

— 237 —

Steel Tape Repair Outfit

Pittsburgh Instrument & Machine Co., 1026 Reedsdale St., Pittsburgh, Pa. [Vol.70,p.455]

Repairing of steel tapes can be done on the job within a few minutes by use of this repair outfit. All the necessary appliances are attached to the tongues. The shears will cut



the various steel tapes in use and the punch will cut through two thicknesses where the splice laps over. The rivet set at the end of the jaws will complete

the job. According to the manufacturer, the rivet holes can be cut near the edge of the splice without danger of splitting the tape.

— 238 —

Wire Stripper, Pliers-Type

Ideal Commutator Dresser Co., Sycamore, Ill. [Vol.70,p. 989]

This stripper has a triplicate action of clamping the wire, cutting the insulation, and stripping, automatically timed and performed with one squeeze on the handles. When the pressure is released, the handles open, resetting the stripper for the next set. Cutting edges are shielded,

and the blind centers of the V-notches on the blades prevent cutting or scarring of the wire being stripped.

The standard models strip from 10- to 20-gage, solid-core or standard wire, and can be converted to handle larger sizes by enlarging the holes. The No. 1 standard stripper handles wires of sizes Nos. 22, 20, 18, 16, 15, 14, and 12. Standard stripper No. 2 handles wires of sizes Nos. 18, 16, 15, 14, 12 and 10.

Transmission Equipment

— 239 —

Speed Reducer, Herringbone, Roller-Bearing-Equipped, Extra-Heavy-Duty

Gears & Forgings, Inc., Cleveland, Ohio. [Vol.70,p.261]

Timken tapered roller bearings are applied on the pinion and gear shafts of this herringbone speed reducer designed to transmit 1,500 hp. normally and

4,000 hp. at peak loads. The unit is driven by an a.c. motor at 360 r.p.m., and drives two stands of 28-in. bar mills. Two 8-ft. flywheels, each weighing 16,000 lb., are mounted on the pinion shaft to take care of peak loads resulting from the mills.

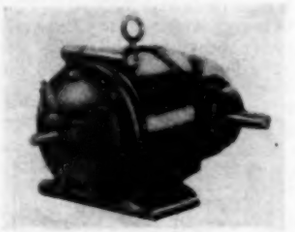
— 240 —

Speed Reducer, Right-Angle, Helical Gear, Types A.R.U. and A.R.P.

Morrison Machine Co., Paterson, N. J. [Vol.70,p.300]

For drives where the slow-speed drive shaft must be at right angles to the high-speed shaft, Models A.R.U. and A.R.P., helical-gear, right-angle speed reducers are applicable. The helical-gear reduction section, similar to the drive previously manufactured, forms the essential part of this unit, the section comprising the right-angle drive being added to it.

The outstanding feature of the unit is the quick adjustability of the high-speed shaft to



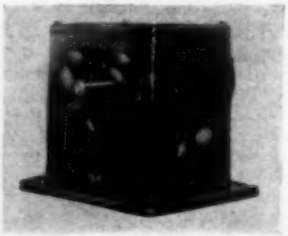
suit the motor to which it is connected. This is accomplished by loosening the clamp on the top of the housing and rotating the complete gear train until the shaft is at the proper height and then clamping it again in position. The slow-speed shaft placed at right angles is also adjustable to any one of eight positions. Anti-friction bearings are used throughout. Elimination of stuffing boxes is brought about through the adoption of a special oil seal. This right-angle drive is made in a number of sizes and capacities in ratios from 6 to 1 to 1,458 to 1, inclusive.

— 241 —

Speed Reducer, No. 4D, "WHS"

Winfield H. Smith, Inc., Springville, N. Y. [Vol.70,p. 301]

Speed reduction ratios from 100 to 1 up to 2,500 to 1 are obtainable in the No. 4D speed reducer. The mechanism consists of a double worm gear



drive having the driven and driving shafts parallel. The unit is particularly suitable for light conveyor drives. Ball thrust bearings are fitted at each end of the two worm shafts. The material used for the gears is a high-grade bronze, and the worms are of steel, hardened and polished. Because of the large ratio of reduction, the actual horsepower ratio is very small.

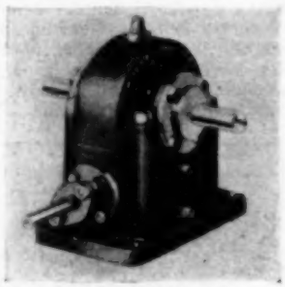
Dimensions are 7¼ in. high, 7½ in. wide, and approximately 11 in. from end of driven shaft to end of driving shaft. Weight 48 lb. net.

— 242 —

Speed Reducers, Worm Gear

Ohio Gear Co., 1333 East 179th St., Cleveland, Ohio. [Vol. 70,p.567]

These small, worm gear speed reducers are built in four sizes, Nos. 0, 1, 2, and 3, the largest of which is rated at 2 hp. They are equipped throughout with Timken roller bearings. Worms are hardened and have the



threads ground. These worms work with phosphor-bronze wormwheels. Practically any ratio between 6 to 1 and 100 to 1 can be obtained.

— 243 —

Power Unit, Speed Reducing

Janette Manufacturing Co., 556 W. Monroe St., Chicago, Ill. [Vol.70,p.755]

This motor-driven speed reducer consists of a worm-gear reduction unit inclosed in a cast-iron housing, which is bolted to a motor frame. The flange of

the gear casing forms the end flange of the motor. The unit is available with motors ranging in capacities from 1/30 to ¾ hp., and with speed reductions from 20 to 1 up to 50 to 1. Standard gear ratios may be obtained and special gear ratios will also be furnished to suit the customer's requirements.

The worm is of hardened steel and the gear is of Bakelite. The gear housing is made oil-tight. Motor bearings are of the Fafnir ball-bearing type. Standard Janette motors are furnished in either d.c. or split-phase, or repulsion-induction a.c. types. Suitable controls are available.

— 244 —

Speed Reducer, Type JFS

Stephens-Adamson Manufacturing Co., Aurora, Ill. [Vol. 70,p.955]

All sizes and types of this speed reducer have been equipped with ball bearings. The ball bearings are accurately set and adequately lubricated. Internal

circulation of the oil bath is accomplished by the splashing of the revolving parts. Two ball bearings support the high-speed shaft and two others support the variable-speed shaft. The oil drain in each bearing cavity is arranged at a height sufficient to insure a constant supply of lubricant at all times.

— 245 —

Coupling, Flexible, Star

W. A. Jones Foundry & Machine Co., 4401 W. Roosevelt Road, Chicago, Ill. [Vol.70,p. 453]

This coupling is composed of two flanged semi-steel castings with three projecting lugs on each half that engage a central star-shaped rubber disk. The slope of the lugs is such that the load on the disk is in compression over a large surface and therefore the tendency is to compress the disk towards the

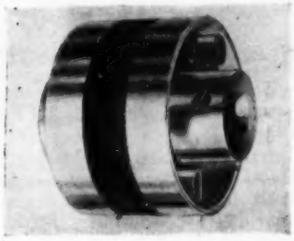
center. The three sizes manufactured are known as Nos. ¾, 1, and 1¼, having corresponding bores in inches. The diameters are 2¼, 3½, and 4½ in., and the overall widths are 2 1/16, 3 7/16, and 4 1/16 in., respectively. The coupling is intended for a maximum speed of 2,000 r.p.m. The three sizes weigh 2, 3½, and 8 lb., respectively.

— 246 —

Coupling, Flexible, Type C

Ajax Flexible Coupling Co., Westfield, N. Y. [Vol.70,p.608]

This light-duty, inexpensive flexible coupling is intended for fractional and small horsepower ratings. It is made of two die-cast flanges connected by means of four setscrews, two in each



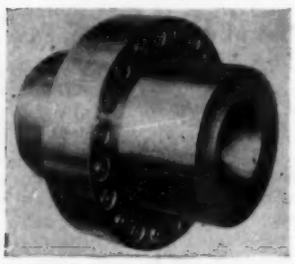
flange, and screwed into four nuts permanently molded into a rubber center piece. The coupling is so designed as to compensate for slight misalignment of the shafts, and to absorb the shock of starting. It is made in bores from ¼ to 1¼ inches.

— 247 —

Coupling, Heavy-Duty, No. 9½ A

Ajax Flexible Coupling Co., Westfield, N. Y. [Vol.70,p.910]

This No. 9½A flexible coupling will transmit 1,200 hp. at 220 r.p.m. It weighs 2,000 lb. and is the largest of its size ever



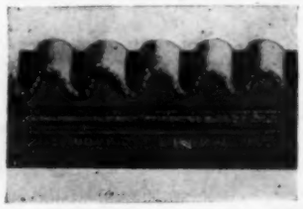
built, according to the manufacturer. The coupling makes use of pins, bushings, and a rubber bumper.

— 248 —

Belt, Cog, V-Type

Dayton Rubber Manufacturing Co., Dayton, Ohio. [Vol.70, p.262]

This endless V-type cog-belt for short center drives will transmit any horsepower within its capacity with minimum slip. The flexibility is secured by the cog-like construction of the inner surface. This cogged surface is not for the transmission of power, but is used to secure flexibility and to prevent buckling. The central zone is composed of a series of convolute layers of pre-stretched parallel



cord fabric, the various layers being vulcanized under tension.

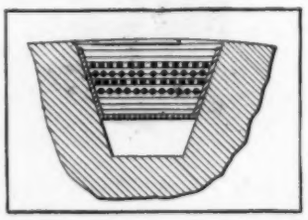
The cog-belt is made endless and is afterward cut to shape. The manufacturer claims that the construction of this cog-belt eliminates entirely both squashing and slip. The minimum outside diameter of the motor pulley allowable is from 2½ in. to 15 in., depending on the horsepower, speed, and starting torque.

— 249 —

Belt, V-, "Flex-Mor"

Fairbanks-Morse & Co., Chicago, Ill. [Vol.70,p.682]

The "Flex-Mor" drive is built up of an outer belt jacket of duck treated with rubber, inclosing a core made up of a layer of rubber, several layers of rubber-embedded cords, and another layer of rubber above the cords. The rubber-embedded cords are laid at the neutral axis of the belt and are



made of long-staple cotton similar to that used in cord tires. The layer of rubber above the cords is compounded to withstand compression. The various elements of the belt are assembled in the molds and vulcanized. The belt makes a gradual contact with the grooves as it bends around the sheaves, and due to the working action and the elastic qualities, there is no sudden grabbing of the load.

Endless V-belts come in a large selection of standard lengths, and are available for transmitting power from a fraction of a horsepower up to 200 and more and for either reducing or increasing speeds at practically any required center distances.

— 250 —

Bearings, Oil-Retaining, "Durex"

Moraine Products Co., Dayton, Ohio. [Vol.70,p.378]

About 20 per cent of oil by volume can be absorbed in the "Durex" bearings, owing to the porous nature of the material, thus giving a reservoir of lubricant to be used before the bearing becomes dry. The maker insists, however, that these bearings are in no sense oilless bearings. It is assumed that they are to be oiled with fair regularity.

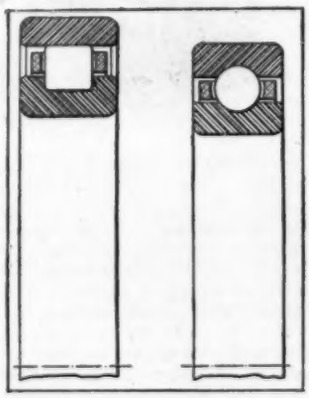
Durex bearings are produced from a mechanical mixture of powered copper, tin, and graphite by compressing it in molds of suitable size and shape. The bearings can be used ordinarily without machining. They can be made for sliding as well as rotating surfaces.

— 251 —

Bearings, Ball and Roller, Extra-Light Series

Norma-Hoffman Bearings Corporation, Stamford, Conn. [Vol.70,p.721]

These extra-light series of ball and roller bearings, referred to as the XLS series ball bearings and the RXLS series roller bearings, are made with very large bores and small outside diameters, so that the sec-



tions are relatively small when compared with the diameters. These bearings are particularly developed for certain types of machine tools where the bearings are mounted on hollow shafts or tubing. Both types are supplied with a substantial bronze retainer, completely machined and riveted, which is carried upon the ground flanges of the inner ring. Both types of bearings are made in inch dimensions, and are obtainable in sizes ranging from 1½-in. bore upwards.

— 252 —

Chain Drives, Stock

Morse Chain Co., Ithaca, N. Y. [Vol.70,p.301]

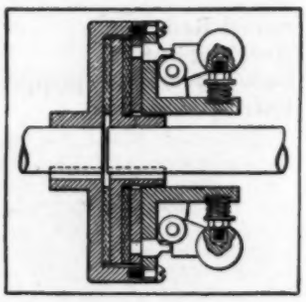
Chain drives from 2 to 20 hp. are now carried in stock at the district offices and distributors of the above company. Bulletin No. 35 has been prepared giving the horsepower, driver and driven speeds, driver and driven bores, and center distances in some cases. The horsepower ratings are based on an allowable pull per inch of width of chain only 60 to 80 per cent of that given generally. For intermittent use under favorable conditions, these horsepower ratings can be raised 25 to 50 per cent. Oiltight chain cases having welded seams and leather packing around the shafts are available for these drives.

— 253 —

Clutch, Accelerating, Washburn

Washburn Shops of the Worcester Polytechnic Institute, Worcester, Mass. [Vol.70,p.336]

By installing the Washburn accelerating clutch between a motor and the driven machine, the starting torque can be reduced and the machine permitted to start with a uniform acceleration. The device relieves both the machine and motor of undue shock and strain and requires a less expensive electrical control. The clutch is



entirely automatic in action and requires no lubrication.

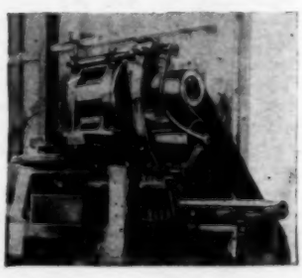
It may be mounted as a coupling between the motor and the machine or may be driven by a belt or chain from the motor. It will operate in either a horizontal or vertical position. There is no limit to the amount of power which may be transmitted by a suitable design. The time of the acceleration varies between 15 to 45 sec., and no friction occurs when running at full speed, thus insuring long life.

— 254 —

Pulley, Idler "Belt-Slacker"

Harry M. Perry, 638 N. Main St., Los Angeles, Calif. [Vol.70,p.761]

The "Belt-Slacker" is a mechanical adaptation of the idler pulley to different machine conditions. Means are provided to



maintain a tension on the belt that will be uniform but flexible. In every case the tension is maintained by means of a spring weight or gravity. The pulley is equipped with tapered roller bearings of a standard make, and it is claimed that the device saves 3 per cent of power. It is to be mounted directly on a motor or machine as shown, or installed with an angular or tilting-type floor stand to compensate for motor adjustment.

Welding Equipment

— 255 —

Welder, Gas-Engine-Driven

Wilson Welder & Metals Co., Inc., Hoboken, N. J. [Vol. 70,p.74]

This special gas-engine-driven welder, equipped with an Ingersoll-Rand air compressor, has the motor and welding unit placed in the front part of the channel bed, the air compressor and receiver being mounted at

the rear. The whole unit is suspended on springs, and pneumatic tires are provided on the wheels. The rubber-tired wheels, together with the special handle, permit pulling the machine behind a truck at a rapid rate.

— 256 —

Welding Outfit, Two-Operator, 300 Ampere "Dualarc"

Electric Arc Cutting & Welding Co., 152 Jeliff Ave., Newark, N. J. [Vol.70,p.415]

Practically one-half of the gasoline consumption needed by two separate 300-amp. welding outfits when idling is required by this apparatus, which consists of two 300-amp. generators placed in line and driven through a common shaft by the engine. This low gasoline consumption obtains from the fact that no appreciable difference in fuel requirements will be noted for an

engine if two generators rather than one are coupled to it, due to the high idling speed necessary to maintain a constant minimum voltage.

A 40-hp. Continental engine is used for the drive. The generators may be of the a.c. or d.c. type, and they are equipped with transformers for supplying current to light drills and grinders. Complete welding accessories are furnished, and an air compressor is mounted on a hinged base. The gasoline consumption on continuous welding is ¾ gal. per hour, and on continuous compressing it is ⅝ gal. per hour.

— 257 —

Welder, Gas-Engine-Driven, Type S

Wilson Welder & Metals Co., Hoboken, N. J. [Vol.70, p.836]

A range of 20 to 600 amp., sturdy construction, narrow frame, and portability characterize the welder, which is adapted to both heavy current and large diameter electrodes for rapid depositing of metal, and also to a short arc with close control of the weld-

ing current for welding and repair work. Close control and quick voltage recovery make the machine suitable for overhead welding.

By setting the pointer on the control panel and adjusting the open-circuit voltage by means of the field rheostat, any desired clearance can be obtained. The generator is self-excited. The reactance provided steadies the arc automatically. The machine operates with metallic electrodes up to ¼ in. in diam. and with carbon electrodes up to ¾ in. in diameter.

— 258 —

Welding Outfit, Two-Operator, "Dualarc"

Electric Arc Cutting & Welding Co., 152 Jeliff Ave., Newark, N. J. [Vol.70,p.953]

Electrical coupling of two generators in multiple to form an improved "Dualarc" two-generator welding outfit has been developed by the above company. This cross-connection is accomplished in such a manner that it is impossible for only one generator to take the load, thus permitting two operators to draw current to suit their needs. The coupling is effected by sending the armature current of the first generator through the series field of the second unit, and sending the armature current of the second through the series field of the first machine. Furthermore, this

arrangement will permit the generators to be put in series so as to secure higher voltages for cutting, carbon arc welding, and for heavy bronze welding. It is possible to get independent control and adjustment and also only one-half power consumption at half demand.

These machines are made in three sizes, namely, 20 to 200 amp., 30 to 300 amp., and 40 to 400 amp. Ratings of the motors are 15, 20, and 25 hp., respectively. The units can also be supplied in the gas-engine-driven type. Overall sizes of all three are approximately 5 ft. long, 3 ft. high, and 2 ft. wide.

— 259 —

Welder, Arc, 300-Ampere, Gas-Engine Driven

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.70,p.992]

This arc-welding set consists of a model P-35 Continental, 4-cylinder gas-engine, direct-connected to a Westinghouse 300 amp., single-operator, type SK, arc-welding generator. The generator has a special bracket that fits into the engine housing for compactness. The generator control-panel is mounted on top of the generator frame, and is fully inclosed by a sheet-

metal cabinet. The welding current is varied over the entire range by means of a single-dial rheostat. Protective covers over generator commutator and engine-hood adapt the equipment for all weather conditions.

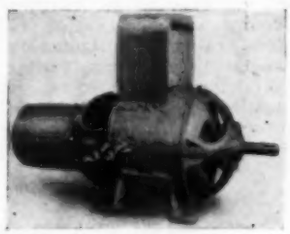
The set is separately-excited, the exciter being flexibly coupled to the welding generator and overhung from the front of the generator bracket. The engine has an S.A.E. rating of 28.9 hp. Fuel consumption is normally 1½ gal. per hr., the gasoline tank holding 28 gal. A pressure-feed system with a gear-type pump is used for lubrication. The set can be made portable.

— 260 —

Generator, Welding, 200-Ampere

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.70,p.912]

This 200-amp. generator without driving unit is for use in isolated places where gas-engines, steam engines, line-shafting, tractors, or similar power units are available. The complete unit consists of a special constant-current type SK welding generator with coupled



exciter overhung on the generator bracket, and a control panel and reactor.

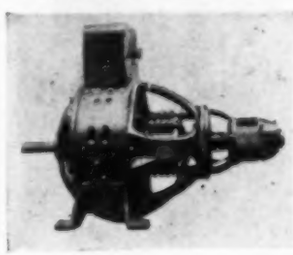
The generator is differentially compound-wound and is designed for a single operator. The constant-current, variable-voltage characteristics, together with the separately-excited feature, provide a fast, steady, and penetrating arc. Variations in arc length or intensity are automatically compensated for by instantaneous changes in the generator voltage. The generator has a range of from 60 to 250 amp., and requires a driving unit whose maximum rating is: Motor, 10 hp.; line-shaft, 15 hp.; gas-engine, 20 horsepower.

— 261 —

Generators, Arc-Welding, Single-Operator, 300- and 400-Ampere

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.70,p.1030]

These arc-welding generators of the belted and coupled type may be used where driving power such as motors, gasoline engines, tractors and lineshaft-



ing are already available. Speeds of 1,750 and 1,450 r.p.m., both clockwise and counter-clockwise, rotation, provide ratings for every application.

The unit includes a generator, direct-connected exciter, control panel, and reactor. The generators have small overall dimensions to permit mounting where space is limited. The control, mounted on top of the generator frame, is inclosed by a sheet-metal cabinet, and includes a voltmeter, ammeter, and a single-dial field rheostat for adjusting the welding current. The welding current range of the 300-amp. unit is 90 to 375 amperes.

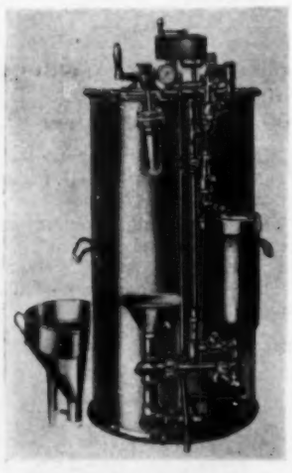
The welding generators are all of a special type SK, single-operator, constant-current, differentially-compound-wound, separately-excited type. Because of the separate excitation, variations of arc length or intensity are compensated for automatically by instantaneous changes of generator voltage. While the units are of the single-operator type, multiple-operator generators can be furnished in standard 500, 750 and 1,000 amp. ratings.

— 262 —

Acetylene Generator, Medium-Pressure, Type MP-101, "Prest-O-Weld"

Oxweld Acetylene Co., 30 East 42nd St., New York, N. Y. [Vol.70,p.451]

Safety, simplicity, and minimum pressure fluctuation during operation are the outstanding characteristics of the type MP-101 acetylene generator intended for use with either medium-pressure or low-pressure welding and cutting blowpipes. The apparatus can be carried easily from place to place, and it is rated at 60 cu.ft. per hour. A charge of 30 lb. of ¼x¼ in. carbide is used.



Fluctuation of pressure during normal operation is less than 1 lb. per sq.in., and the pressure limit is 15 lb. per sq.inch.

Bronze welding is used for joining the generator shell, and all parts are either sherardized or galvanized. The carbide valve is rotated by means of a spring clock motor, which is governed by an "Oxweld" diaphragm-type, motor feed control. The hopper and generator body are designed so that no water will enter the hopper in case the generator is knocked over.

Overall dimensions: Height 60 in., width 34 in. Weight empty, 305 lb., full 623 pounds.

— 263 —

Welding Outfit, Oxy-Acetylene, "Leader," Rego

Bastian-Blessing Co., 240 E. Ontario St., Chicago, Ill. [Vol. 70,p.187]

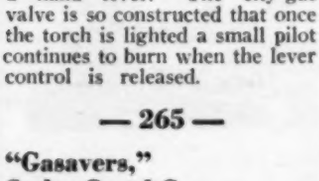
The standard outfit includes two regulators, one for oxygen and the other for acetylene. Each regulator is equipped with two gages. The regulators are made of forgings throughout and have large expansion chambers. The devices can be taken apart and put together again without the use of special tools. Other equipment includes: Three Type GMP copper welding tips, two 12½-ft. lengths of ¼-in., D.F. corrugated, woven, high-pressure hose, torch wrench, and a regulator wrench. Extra equipment includes: A GME 12-in. mixer and GMP tips Nos. 33 and 29, which can be used to increase the range of work done.

— 264 —

Torch, Gas-Air, Automatic, "Torit"

St. Paul Welding & Manufacturing Co., 174 W. Third St., St. Paul, Minn. [Vol.70,p.646]

Two valves, one for city gas and the other for compressed air, are provided and they are both operated simultaneously by



a hand lever. The city-gas valve is so constructed that once the torch is lighted a small pilot continues to burn when the lever control is released.

— 265 —

"Gasavers," Styles C and G

Weldit Acetylene Co., Detroit, Mich. [Vol.70,p.337 and p.569]

Not only is it possible to conserve welding gas with the Styles C and G "Gasavers," but these accessories effect a saving in the time usually required to

adjust the torch flame when the work is temporarily held up. When the torch is held on the arm, the flame is extinguished immediately. By lifting the torch from the arm and passing it over the convenient pilot light at the top, it is lighted instantly.

The Gasaver is placed between the supply tank regulators and the feed lines of the torch. Both gases are passed through the device. The Style C uses acetylene, hydrogen, or illuminating gas in combination with oxygen and Style G controls illuminating gas and compressed air.

— 266 —

Holder, Carbon-Electrode, Water-Cooled, Type W

Lincoln Electric Co., Cleveland, Ohio. [Vol.70,p.378]

Designed primarily to insure greater comfort and less fatigue for the welder operator, this type W, water-cooled, carbon-electrode holder is intended to be used for heavy-duty manual welding. By its use it is pos-

sible to weld with the arc tip projecting less than 3 in. from the holder, thus greatly reducing the vaporization of the carbon.

The hose used to carry the cooling water to and from the holder also contains the cable supplying the current. The electrode holder consists of a coil of copper tubing through which the water circulates constantly, the carbon electrode being inserted through the coil. The device is manufactured in sizes for use with ¼-, 5/16-, ⅜-, and ½-in. carbons.

— 267 —

Holder, Electrode, Type T

Lincoln Electric Co., Coit Road & Kirby Ave., Cleveland, Ohio. [Vol.70,p.570]

This improved electrode holder for metallic-arc welding, known as the Model T, consists essentially of a powerful clamp to hold the welding electrode firmly, and an easy release feature. It is claimed that the holder remains cool during operation, because the welding current is carried from the

point of the cable entry to the copper jaws by means of copper strips of low resistance. Sticking of the electrode to the jaws is reduced by the use of copper tips. The shape of the holding clamp has been altered to give greater compactness so as to permit close work.

— 268 —

Electrode Holder, Metal

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.70,p.1025]

To take all commercial sizes of arc-welding electrodes up to and including ¼ in. in diam., a light-weight metal holder has been developed. The jaws will grip the electrode in any position. The close distance be-

tween the lower jaw and the upper handle allows the device to be used in close quarters.

The holder is furnished with or without 5 ft. of flexible cable. For light carbon electrodes, either 3/16- or ¼-in., an adaptor can be furnished.

Weight, 18 oz. without cable.

— 269 —

Welding Rod, Bronze, High-Strength, No. 21

Oxweld Acetylene Co., 30 East 42nd St., New York, N. Y. [Vol.70,p.411]

This improved rod is recommended by the manufacturer for all bronze welding applications, including the fusion welding of brass and bronze, bronze-welding of malleable and gray-iron castings, joining dissimilar metals, and building up bearings and other wearing surfaces. It has a uniformly low melting point and easily controlled flow, and produces a weld metal as hard and wear resistant as that formerly made with manganese-bronze rod, it is claimed. By its use, tough and ductile weld metal having a tensile strength of over 45,000 lb. per sq.in. can be produced.

Electrical Equipment

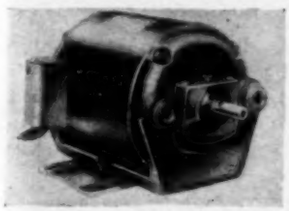
— 270 —

Motor, Rubber-Mounted, Type 57 RA

Wagner Electric Corporation, 6400 Plymouth Ave., St. Louis, Mo. [Vol.70,p.223]

Rubber mounting of the type 57 RA motor has resulted in a very quiet machine. The motor is completely insulated from the base by means of rubber bushings. The mounting has been effected without a change in overall length or widdth.

In addition to the mounting,



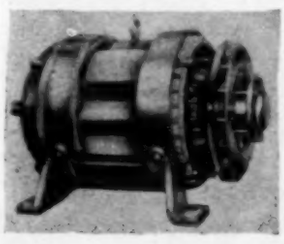
the motor has also undergone alterations to further improve quietness and electrical performance. In addition to equipping the governor weights with rubber bumpers, the rocker arm has been redesigned to decrease brush noise during starting and stopping. The power factor and efficiency have also been improved.

— 271 —

Motor, Squirrel-Cage, Fan-Cooled, Totally-Inclosed, Type CS

Westinghouse Electric & Manufacturing Co., Pittsburgh, Pa. [Vol.70,p.224]

Designed for use in locations where the dirt conditions are too severe for the ordinary standard open motor, this type has the important feature that its size is practically the same as that of the standard open motor of equivalent rating. The stator differs in that the ends of the windings are inclosed in a sheet-metal housing. The rotor is identical except for the



addition of collars which serve as supports for the external cooling fans. The clean air sealed in the interior of the motor is kept in circulation by blowers on the ends of the rotor, and heat generated in the windings is transferred to the protective housings, where it is dissipated.

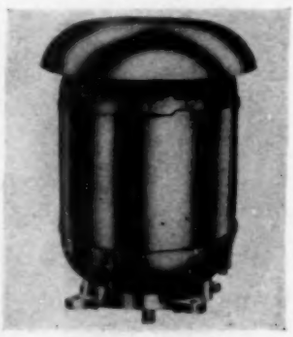
This motor is supplied equipped with standard ball bearings. It uses the same control as any standard squirrel-cage induction motor.

— 272 —

Motors, Vertical, Standard, Small

Wagner Electric Corporation, 6400 Plymouth Ave., St. Louis, Mo. [Vol.70,p.528]

Interchangeability of various sizes on the same mounting base, because they all have the same flange or lug dimensions, makes it unnecessary to change the base in order to interchange the vertical motors of different types and ratings. The line includes repulsion-induction, split-



phase, squirrel-cage, and d.c. motors, built in 25- to 60-cycle models for operation at 1,200 to 3,600 r.p.m. The ratings range from ½ to 1½ hp. Either oblique, vertical, or horizontal mountings can be used. The Wagner labyrinth seal prevents leakage of lubricant into the motor windings and makes dustproof and leakproof bearing housings.

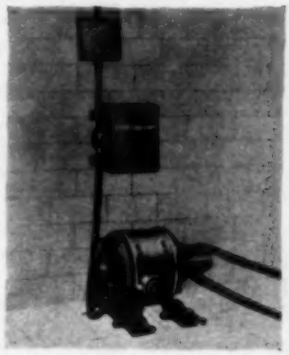
— 273 —

Motor, Single-Phase, Brushless, Type CI, "Red Band"

Howell Electric Motors Co., Howell, Mich. [Vol.70,p.609]

Characteristics of operation like those of polyphase motors are embodied in this machine, which has no brushes, commutator, wire-wound rotor, internal switching device, or soldered rotor contacts. At the same ratings, its starting and pullout torques, power factors, and efficiencies correspond to those of polyphase motors. All modifications obtainable in polyphase units may be had in this design.

Because of the elimination of sliding contacts, the motor will not spark. It can be plugged and reversed at full speed, making it suitable for



single-phase operation of hoists and woodworking machines. High starting torque is supplied by an external starting unit containing the starting condenser and a simple contactor.

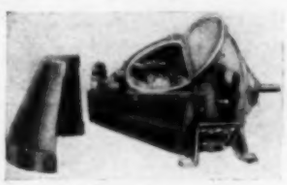
— 274 —

Motor, Fan-Cooled, Totally-Inclosed, Type SK

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.70,p.755]

All mechanical parts on this motor, with the exception of the shaft, are interchangeable with those parts used on the totally-inclosed, standard type SK d.c. motor of the same frame size. Likewise, the essential mounting dimensions are the same as on the standard, type SK open motor of the same frame size.

Bracket openings are inclosed



by solid, flat covers and gaskets. Sealed sleeve bearings are used, and the motor is protected from dust and fumes. The commutator end is further inclosed with a sheet-steel cover having a perforated protective end through which the fan draws the cooling air. Air is directed over the bracket and passes over the top of the motor, cooling approximately three-quarters of its surface. The motor is applicable in any location where the air is full of foreign matter injurious to windings, such as in coal handling equipment, paint shops and foundries.

— 275 —

Motor, Rubber-Mounted, Type RAR

Wagner Electric Corporation, 6400 Plymouth Ave., St. Louis, Mo. [Vol.70,p.913]

The motor proper is completely insulated from the supporting cradle-shaped base by means of rubber bushings, effecting exceptionally quiet running. The entire machine is practically rigid and the shaft alignment is in no way endangered. The mounting has been effected without a change in overall length and width dimensions.

The motor is of the brush-lifting type. High starting and pull-out torque are claimed for the motor, with minimum line

disturbance. Further, in addition to equipping governor weights with rubber bumpers, the rocker arm has been redesigned to prevent brush noise during starting and stopping. The power factor and efficiency exceed the N.E.M.A. requirement.

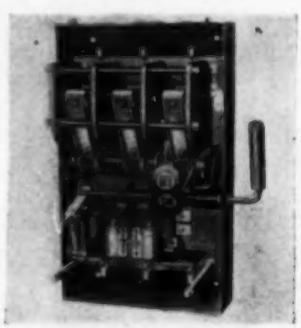
— 276 —

Circuit Breakers, Inclosed, Free-Handle, Type EAF

Roller-Smith Co., 233 Broadway, New York, N. Y. [Vol. 70,p.417]

Offered for the protection of motors and feeder circuits against overload and failure of voltage, all of these breakers are of the free-handle type, that is, non-closable on overload. Overload coils are standard equipment on either the two- or three-pole combinations and time-limit protection is afforded by means of dashpots. Either one or two undervoltage attachments can be placed on any breaker in addition to a shunt trip attachment.

The type EAF breaker is in-



closed in a two-piece steel case so designed that the cover may be completely removed from the bottom by simply taking off two wing nuts. The breaker proper may be removed from the case during wiring. A barrier unit separates the arcing members from each other.

— 277 —

Circuit Breakers, 15-Ampere

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.70,p.953]

When an abnormal overload occurs on a branch circuit this "Deion" breaker opens automatically and can be immediately re-closed provided the overload condition is not sustained. Since the automatic mechanism trips free of the handle, the contacts cannot be held closed against an abnormal

overload or short circuit. The breaker consists of a toggle mechanism actuating the moving contacts and insuring full contact pressure up to the time of opening. The automatic release is secured through a bimetallic thermal element engaging the releasing latch of the mechanism.

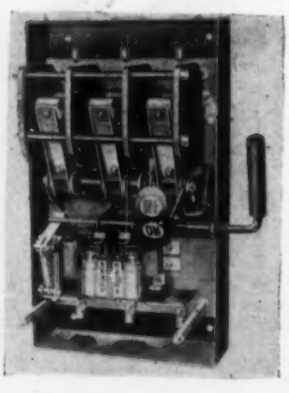
The circuit breaker will carry 10 per cent above normal load indefinitely without tripping, 50 per cent above normal for less than 2 min., and higher overloads only instantaneously. It is inclosed in an insulated sealed housing.

— 278 —

Circuit Breakers, Type EAF

Roller-Smith Co., 233 Broadway, New York, N. Y. [Vol. 70,p.1032]

Several models have been added to the line of Type EAF small, inclosed, air-break, circuit breakers of this company. These models are a 3-pole unit with three overload coils, a 4-pole model with two overload coils, a 4-pole unit with four overload coils, and plain undervoltage, two-, three-, or four-pole models. The line is now applicable to nearly every type



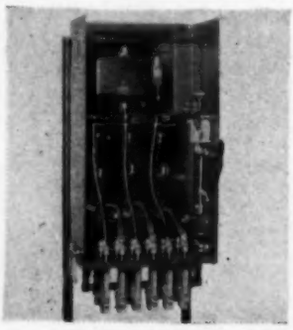
of service required of this type of circuit breaker. It is rated at 80 amp., 550 volts and less a.c., and 250 volts and less d.c. Features are the overload coils, instantaneous trip, time-delay trip, and undervoltage device. The free-handle circuit breaker is inclosed in a steel cabinet.

— 279 —

Compensator, High-Interrupting

General Electric Co., Schenectady, N. Y. [Vol.70,p.222]

High interrupting capacity is the feature of this manual starting compensator, which bears the designation of CR-1034-K-33. It is especially applicable to the control of high-speed, squirrel-cage motors. Among the features claimed are: Switch design providing wide



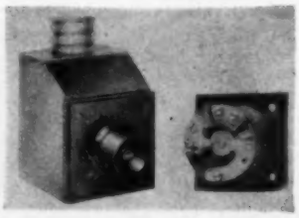
break and high interrupting capacity; a time delay, undervoltage release, preventing shutdown on brief power disturbances and assuring that, in case of short circuits, the line protective devices will open first; contact tips of standard contactor construction; and cabinet construction of the case for wall mounting, with ample room for wiring connections.

— 280 —

Push Button, Safety-Type

Lincoln Electric Co., Coit Road & Kirby Ave., Cleveland, Ohio. [Vol.70,p.299]

The ball top "start" button is contained inside a large "stop" button, which projects over the start button. Thus, the large



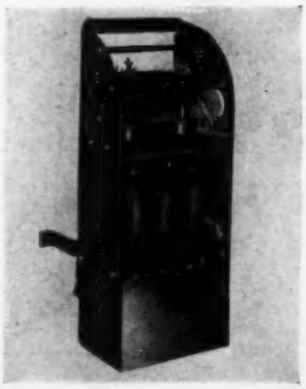
projecting stop button protects the start button from accidental contact. The latter can only be operated by the tip of the finger inserted inside the stop button. The inner mechanism is inclosed in an arc-welded steel box 2¼x 3¼x2½ in. in size. All insulating parts are of molded Bakelite. The entire operating mechanism can be removed from the case for wiring. An opening ¾ in. in diam. at the top permits the entrance of the conduit.

— 281 —

Compensator, Hand-Starting, Oil-Immersed

General Electric Co., Schenectady, N. Y. [Vol.70,p.379]

For use in places where there are explosive gases this device, bearing the designation CR-1034-N-52, is a modification of standard equipment designed to prevent exposed arcing. The starting switch is oil-immersed, and, in addition, the usual push-button tripping device is not included in the equipment, but, instead, a standard time-delay undervoltage attachment and dashpot relays are used, with Cooper-Hewitt mercury tubes substituted for the usual contact tips of the dashpot relays. As a result of this arrangement, exposed arcing or sparking at



contacts is prevented. The compensator is available for use with motors operating on 25 to 60-cycle, two- or three-phase circuits, in sizes as follows: 15 hp. and less, 100 volts; 125 hp. and less, 220, 440, and 550 volts.

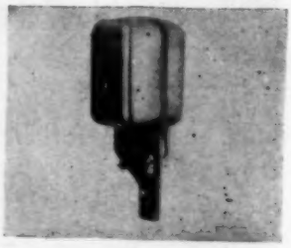
— 282 —

Relays, Undervoltage, Time Delay, Types MG-2 and PF-2

General Electric Co., Schenectady, N. Y. [Vol.70,p.221]

Two devices, intended for protection against failure of voltage on power circuits, and which operate after a suitable time interval, have been offered bearing the designations of MG-2 and PF-2. They will not cause interruption to service when momentary voltage dips occur.

The MG-2 device is designed to operate in conjunction with suitable motor-operated mechanisms, and is available for use on a.c. circuits only. It has an electrically-interlocked switch, which is so connected that power cannot be turned on un-



less the protective unit is in operative condition. This device is adapted for motor and synchonous converter service.

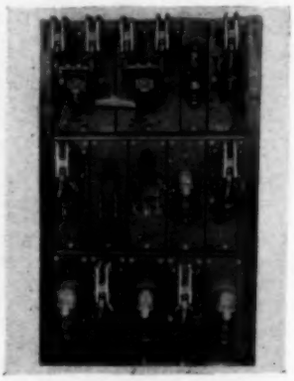
The PF-2 undervoltage device is of the solenoid and plunger type with an air bellows for time delay. The time can be varied from approximately 1 sec. to 1 min. This device can be applied to certain types of oil-circuit-breaker operating levers. Each device contains a motor, helical spring, and gear train.

— 283 —

Relay, Acceleration, Time-Current

Electric Controller & Manufacturing Co., 2700 East 79th St., Cleveland, Ohio. [Vol.70, p.338]

This acceleration relay, which operates on a new principle, has the advantages of the usual systems of acceleration. It gives the maximum output by means of time-current control on light loads such as screw downs and mill tables and other drives, where fast operation is required. On heavy loads, accelerations up



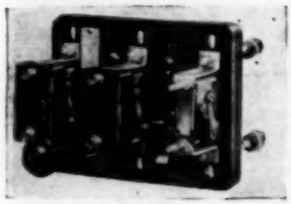
to 2 sec. per step can be had automatically without any change in adjustment. A complete line of shunt contactors and a plugging relay as well as the time-current acceleration relay are embodied in the device.

— 284 —

Relays, Temperature Overload, Types TC-121 and TC-131

General Electric Co., Schenectady, N. Y. [Vol.70,p.339]

Constructional features permit the user to remove and insert heating elements when necessary and allow the use of a



third relay unit on the same base when it is desired to protect three legs of a circuit.

The line is divided into two parts, bearing the designations TC-121 and TC-131. The former is designed for the protection of two legs of a circuit, while the latter provides an element for the protection of a third leg. Both forms are rated in current-carrying capacity from 30 to 150 amp., and are available for either front or back connections.

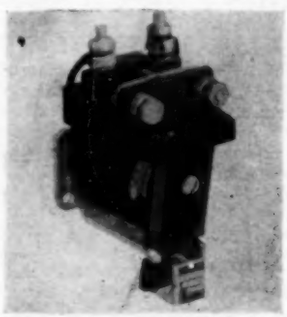
The back-connected forms are for panel mounting, but use the same base as the front-connected forms. An electric reset is provided as an accessory. When used with a relay a sub-base is added.

— 285 —

Relay, Warning, Power-Failure

General Electric Co., Schenectady, N. Y. [Vol.70,p.680]

For use on various types of alarm circuits, this type CR-2810-1245 relay has been announced. The device is of the normally-closed type, and functions to actuate a warning sig-



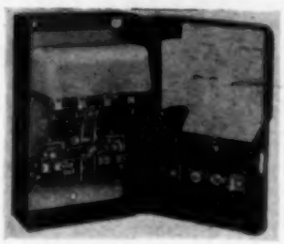
nal on the failure of power. It is strongly built, simply constructed, and operates quietly. The double-break contact construction is of the silver-to-silver type. The device is made in standard ratings.

— 286 —

Starter, Bulletin No. 709

Allen-Bradley Co., 286 Greenfield Ave., Milwaukee, Wis. [Vol.70,p.35]

Except for the redesigned, longer cabinet, this starter is the same as that described for the former Type J-1552, Form B starter described on page 230, Vol. 66, of the *American Machinist*. It has the same ratings of 5 hp. at 220 volts, and of 7½ hp. at 440 or 550 volts. The inside length has been increased 1¾ in., providing liberal space for convenient and safe wiring. The starter is furnished in three forms: Form 1



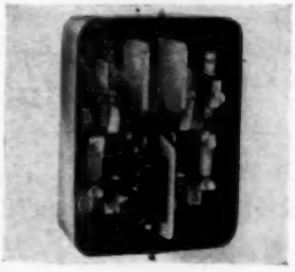
with push buttons in the cover; Form 2 for remote control, and Form 3 with lever switch for automatic or manual control.

— 287 —

Starters for Small A. C. Motors

General Electric Co., Schenectady, N. Y. [Vol.70,p.263]

The first of the two switches, No. CR-7006-D-26-A, is a three- and four-pole magnetic switch with self-contained start and stop stations, and the No. CR-7006-26-D is a switch for similar service, and especially designed to provide plenty of wiring space. The A type contains the standard overload protection and undervoltage pro-



tection or release. It is used for small motors that can be thrown directly on the line, and it consists of a triple-pole, barrier-type contactor and a double-coil thermal overload relay, all mounted on a molded base in a drawn-shell steel inclosing case. It is intended for location at the driven machine, making remote push-button control unnecessary.

The type D switch, although for the same general class of application, is desgned for use with remote push-button stations. Plenty of room is provided for the arc, thus preventing flashovers.

— 288 —

Switch, Across-the-Line, Oil-Immersed

General Electric Co., Schenectady, N. Y. [Vol.70,p.375]

This small, oil-immersed switch for use in throwing small a.c. or d.c. motors across the line is simple in construction

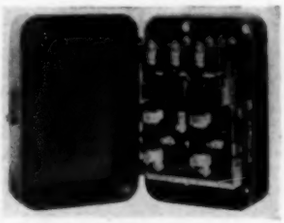
and has a minimum of component parts: A one-piece cast-iron cover, including the switch mechanism, and a small cast-iron tank for the oil. The molded compound switch base carries the contactor assembly. The switch is suitable for wall mounting.

— 289 —

Starter, Across-the-Line, Type A-30

Condit Electrical Manufacturing Corporation, 838 Summer St., S. Boston, Mass. [Vol. 70,p.528]

Intended for use with squirrel-case induction motors, this motor starter is built in sizes for motors up to 20 hp. operating on 550 and 450 volts, 15 hp. on 220-volt circuits, and 7½ hp. on 110-volt circuits. Arc prevention is brought about by practically minimizing ionization. Having



no barriers or arc chutes, the type A-30 starter is simple and compact in design. It is inclosed in a substantial pressed-steel case, arranged for conduit knockouts. It may be furnished with thermal relays for time-lag, overload protection, and under-voltage protection.

— 290 —

Starter, Across-the-Line, Safety Type

Lincoln Electric Co., Coit Rd. and Kirby Ave., Cleveland, Ohio. [Vol.70,p.917]

Ease of installation, accessibility to all operating parts, and sturdy construction are some of the features of this across-the-line starter. Installation of this unit is simple, only four screws being required to hold it in place. Releasing two other screws permits the contactor panel to swing out, thus making the lead contact accessible. A cover of the drop-hinge type inclosures the entire mechanism.

The starter, which is controlled by a push button, is equipped with contact points so designed that wiping action prevents pitting. The cadmium-plated steel shields provide an instantaneous thermal and magnetic quench for the arc. Arc chimneys are of heavy pressed magnesite. The safety feature is that the red stop button en-

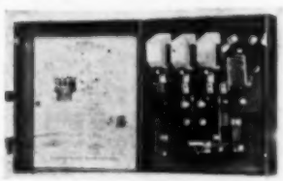
circles and protects the green start button so that it is impossible to close the starting circuit unintentionally.

— 291 —

Starter, Line, Class 11-200

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.70,p.910]

Increased safety, economy, and ratings on Class 11-200 line starters are made possible by the use of the "Deion" contactors. The Deion contactor is an effective arc rupturing device and confines, divides, and smothers the arc quickly before the usual flash and attendant scattering of flame. These contacts are guaranteed to rupture



from twelve to sixteen times their normal current-carrying capacity at rated voltage, under severe operating conditions of low power factor and sustained voltage.

— 292 —

Starter, Across-the-Line, Small

General Electric Co., Schenectady, N. Y. [Vol.70,p.1030]

The switch is designated as CR-1038-E-1 and has a maximum rating of 1 hp. at 110 volts, and 2 hp. at 220 to 600 volts, 3-phase. It consists of a tumbler switch and two small thermal cutouts mounted on a common

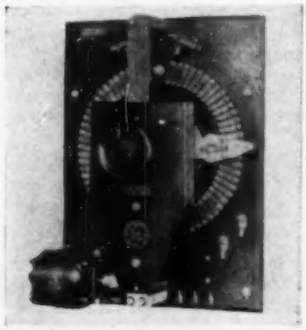
Textolite base. By means of suitable interlocks, the switch can be locked in either the open or closed position. Of particular value to the textile industry is the optional use of either single or double pedestals for mounting near the controlled machines. The links of the cutouts are of tinned copper to prevent oxidation and the contact spring and post are tin plated.

— 293 —

Switches for Field Rheostats, Radial

General Electric Co., Schenectady, N. Y. [Vol.70,p.336]

These switches are for general application where the current is more than 50 amp. and not over 300 amp. There are five forms: hand, sprocket, gear, solenoid and motor operated. These bear the designations CR-8090, CR-8190, CR-8290, CR-8390 and CR-8490, respectively.



The outstanding advantage of these switches is the fact that they have renewable segments, which may be reversed for increased service.

All of these switches of a given current rating have the same number of divisions. The user can change easily from a sprocket-operated switch to a solenoid- or motor-operated type

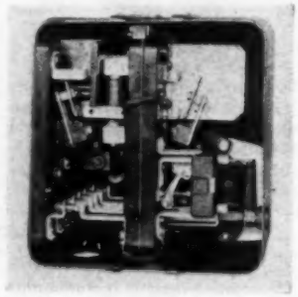
— 294 —

Switch, Motor Control

General Electric Co., Schenectady, N. Y. [Vol.70,p.837]

Intended to take the place of the magnetic switch, motor circuit switch, and the inclosed fuses usually required in controlling the operation of a motor, this type CR-7006-F-1 switch can be applied to control any motor where a general-purpose magnetic switch would be used, and where its special features are desirable. It is compact, easily accessible, and readily installed.

The switch consists of three sections, a back portion containing a motor circuit switch, a middle portion containing a base on the front of which the magnetic switch is mounted and



on the back of which clips are provided for fuses, and the front cover. The back portion is built for wall mounting. Overload protection is provided.

— 295 —

Contactor, A.C., Bulletin No. 701

Allen-Bradley Co., 286 Greenfield Ave., Milwaukee, Wis. [Vol.70,p.911]

For apparatus requiring an automatic control switch of small capacity, the No. 701 contactor has been developed. It is provided with silver contacts and the entire assembly is mounted on a molded Bakelite base. All switch parts are cadmium plated to prevent corrosion. This switch can be provided for operation on 6, 12, 24, 110 or 220 volts and for any

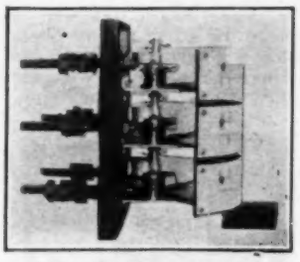
frequency from 25 to 60 cycles. Current ratings range from 15 to 30 amp.

— 296 —

Ammeter, Polyphase, Type HEA-3

Roller-Smith Co., 233 Broadway, New York, N. Y. [Vol. 70,p.36]

Readings of the current for each of the three phases can be taken simultaneously, and it is possible for the observer to determine whether or not the phases are properly balanced. The scale is 7½ in. long, and permits easy visibility. A feature of the instrument is the small space occupied.



— 297 —

Fuse Pullers

Ideal Commutator Dresser Co., Sycamore, Ill. [Vol.70,p. 646]

These four fuse pullers, made up of laminated horn fiber, have plenty of jaw surface. The "Midget" size is 5 in. long, and

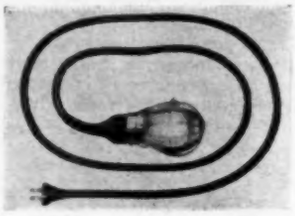
is suitable for handling small fuses from ¼ to ½ in. in diam. and small screws. The "Pocket" size is 7½ in. long, and is used for pulling fuses up to 200 amp. at 250 volts, and from 1 to 100 amp. at 600 volts. The "Giant" size is 12 in. long for pulling fuses rated at 100 to 600 amp. 250 volts, and 60 to 400 amp. at 600 volts. The "Jumbo" is 20 in. long and capable of pulling fuses from 200 to 800 amp. at 250 volts, and 200 to 600 amp. at 600 volts.

— 298 —

Lamp set, Extension, "Unicord"

Resilient Terminals Co., Oakland, Calif. [Vol.70,p.647]

This lamp set is inclosed in soft rubber from terminal to terminal, making it liquid proof and eliminating the possibility of fine wires working loose under strain and causing a short circuit. The lamp socket is



heavily protected but is short, and is handy for getting into small places. The shell of the socket and the contact points are cadmium-plated to prevent corrosion. The "Unicord" set is made in standard lengths of 20, 25, and 30 ft. Greater lengths can be secured at extra cost.

Materials

— 299 —

Steel, KA-2, "Enduro"

Central Alloy Steel Corporation, Massillion, Ohio. Ludlum Steel Co., Watervliet, N. Y. Babcock & Wilcox Tube Co., 85 Liberty St., N. Y. [Vol.70, p.190]

License rights to manufacture improved stainless steel under Krupp Nirosta patents have been obtained from Fried. Krupp, A. G., Germany, by the above companies. These three licensees have organized for joint research and promotion of this improved stainless product. This material is said to be resistant to air, water, dilute solutions, and acids at high temperatures and at high pressures. It can be deep drawn, wire drawn, machined readily, and welded by electricity or gas. Further, it can be polished to a mirror-like surface, is non-magnetic, and has approximately the ductility of copper.

The steel is now available in all standard forms from the above manufacturers. It is stated by the manufacturers that the addition of nickel greatly increases the corrosion resistance of the alloy, and provides complete immunity to many materials which attack straight, stainless irons, thus making it suitable for many applications where great ductility is demanded together with stainless properties.

— 300 —

Cutting Metal, Tungsten-Carbide, "Camite"

Cleveland Automatic Machine Co., 2269 East 65th St., Cleveland, Ohio. [Vol.70,p.760]

"Camite" is an American development. The hardness ranges little less than that of the diamond. The cutting metal is furnished in the form of platens in definite stock sizes, or special sizes and shapes furnished to order. The platens are attached to suitable shanks or toolholders by brazing and then ground to a cutting edge.

The material is marketed with claims of very high cutting speed. Cuts of two or three times the customary depth have been made on long test runs without detriment to the tool, according to the manufacturer. The material will successfully accomplish intermittent cuts under severe conditions.

— 301 —

Steel, Tool, Air-Hardening, "Dasco"

Detroit Alloy Steel Co., foot of Iron St., Detroit, Mich. Mich. [Vol.70,p.1032]

An alloy tool steel cast to shape, or furnished in rolled bars and billets for forging, is being marketed under the trade name of "Dasco." This tool steel when hardened, annealed, or normalized after forging, is cooled in still air, which prevents distortion and danger of internal strains and cracking. Intricate shapes can be made, leaving only enough material to clean up the casting where finish is required. Tools of this material will produce from three to six times the usual number of pieces per dressing, it is claimed.

In the annealed condition, the tool steel shows a scleroscopic hardness of 36 to 40, is readily machinable, and can be drilled and tapped without difficulty.

— 302 —

Alloy, Corrosion-Resistant, "Illium"

Burgess-Parr Co., Moline, Ill. [Vol.70,p.992]

This complex alloy is based on the nickel-copper-chromium ternary system, and contains small percentages of silicon, molybdenum, manganese and tungsten. It resists the action of such liquids as persulphuric acid, phosphoric acid, acetic acid, mine water, alkalis, and salts.

The alloy is cast in special forms. It is used for pump parts, such as nuts, bolts, washers, and rotors, and chemical stirring rods and agitators. It possesses the following physical characteristics: Tensile strength, 73,000 lb. per sq. in.; elastic limit, 63,500 lb. per sq. in., elongation in 1 in., 3.5 per cent; hardness, Brinell 137; torsional strength, 1¼ in. bar, 35,620 lb.; melting point, 1,300 deg. C.; contraction in casting, $\frac{1}{16}$ in. per ft.; machinability, slightly harder than cast steel.

— 303 —

Primer for Iron and Steel, "Bonderite"

Parker Rust-Proof Co., 2177 East Milwaukee Ave., Detroit, Mich. [Vol.70,p.1032]

"Bonderite" is a primary non-metallic coating, sufficiently absorbent to insure perfect cohesion with the applied coating of paint, enamel, or lacquer. It will give a bond that will last from eight to twelve times longer than obtainable without it, according to the manufacturer. Even when the outer coating is chipped off, no moisture can get under the primer and cause corrosion. Furthermore, the Bonderite coating is opaque and uniform in color so that the finish applied will be uniform. Because but 10 to 12 min. are required for the process, it is suitable for mass production operations.

Bonderite is available in powder form. It dissolves readily in boiling water so that plain open tanks with steam connections may be employed. The coating is velvety and dark red in color and may be obtained without special preliminary cleaning operations. After processing, rinsing is required, followed by quick drying and wiping with a tack rag. Where very fine finishes are demanded, a light smoothing with steel wool may be employed.

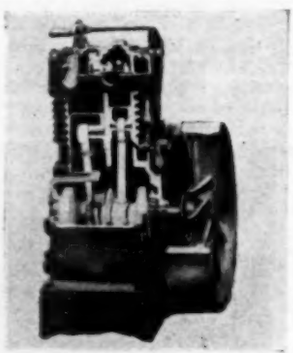
Miscellaneous Equipment and Supplies

— 304 —

Compressors, Roller-Bearing-Equipped

Curtis Pneumatic Machinery Co., St. Louis, Mo. [Vol.70,p.415]

Eleven models ranging from ½ to 5 hp. and suitable for air pressures of 150 to 200 lbs. per sq. in. are manufactured. These



are either stationary or portable, with or without tanks, and for motor, gas-engine or line-shaft drive. Automatic or manual starting and unloading devices are provided as desired. There are three general classes: Single-cylinder, single-stage; two-cylinder, two-stage, and two-stage. All are of vertical construction. The first two are for intermittent service under pressures not exceeding 150 lb. per sq. in. and are either air or water cooled. The two-stage type is for either intermittent or continuous service from 150 to 200 lb. per square inch.

The cylinder walls are honed. Pistons, piston rings, and piston pins are of hardened steel, and shafts are ground. Crankshafts and connecting rods are drop-forged steel. Main bearings are of Timken roller type.

— 305 —

Coupling, Air-Hose, Plain, "Midget"

Robinson Machine Co., Muskegon, Mich. [Vol.70,p.224]

A one-quarter turn disconnects this air hose coupling. The device illustrated has no springs or loose parts to wear

or break. A special leather gasket, which is not affected by oil or other air-line substances, is used.

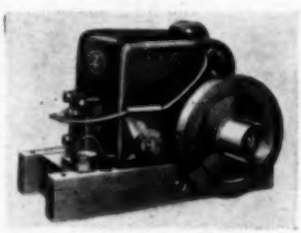
The weight of the device is less than 8 oz., and it is 1 in. in diam. The coupling with the hose shank is 3 in. in overall length. It is made interchangeable in ¾ and ¾ in. sizes for pipe and hose lines.

— 306 —

Gas Engine, Inclosed, Portable

Fairbanks, Morse & Co., Chicago, Ill. [Vol.70,p.991]

A line of gasoline-kerosene engines in ratings from 1½ to 7½ hp. has been announced. These engines have been simplified to comprise approximately 25 per cent less parts than previously. Cylinder, water hopper, crankcase and bearing supports for both crankshaft and camshaft are integral parts of the cylinder and base casting. The engine, with the exception of the magneto, can be entirely assembled on this casting. Removal of only two bolts permits opening the inclosure and exposes all of the working parts.



Removal of eighteen bolts completely dismantles the entire engine.

The engine is self-oiling through a special lubricating system. Felt retainers on the crankshaft and camshaft, return oil grooves on these shafts, and a special crankcase breather prevent oil leakage.

The 1½-hp. size will drive portable pumps, air compressors, generators, saws, grinders, polishers, and similar equipment. It is less than 16 in. high, 22 in. long, and 19 in. wide, and weighs 150 lb. Two pulleys are provided, one of which operates at the engine speed of 1,500 r.p.m. and the other at 750 r.p.m. A mechanical regulator permits slowing down the engine.

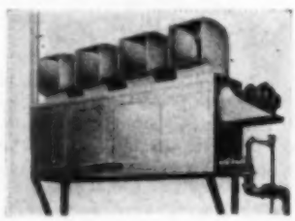
— 307 —

Heaters, Industrial, Unit, "Lowboy" and "Highboy"

Buffalo Forge Co., P. O. Box 985, Buffalo, N. Y. [Vol.70,p.226]

Positive circulation of heated air is assured by the use of the "Lowboy" and "Highboy" unit heaters. These are similar in design, except that the "Highboy" has two sections of heating elements. Each type can be installed vertically, horizontally, or inverted, and each is suitable for floor mounting, wall bracket mounting, or for ceiling suspension

The heater has four units, each unit having its own fan.



The multi-rotors are all mounted on one shaft having ball bearings at each end. The heating elements are made up of "Universal Aerofin" tubing suitable for pressures from 2½ to 150 lb. per sq. in. The heater element can be removed at either end.

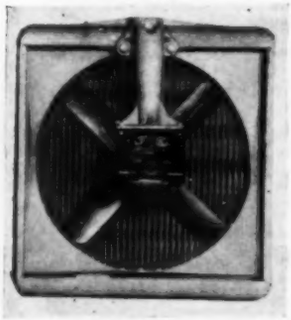
The heater can be assembled with steam or drip connections on either end as desired. When mounted upright, the Highboy has an overall height of 90 in. The extreme width is variable from 61 to 100 in. for three sizes manufactured. The Lowboy has a height of 60 in. overall, the other dimensions being the same as for the larger model.

— 308 —

Heaters, Unit

Young Radiator Co., Racine, Wis. [Vol.70,p.417]

These heaters may be used for combined heating and ventilating service, and for drying, heating or cooling in production processes. Either steam or hot water is supplied through an inlet pipe, 1¼ to 2 in. in diam., and discharged through a ¾ or 1 in. return connection. The condenser consists of flattened vertical copper tubes designed for maximum heat diffusion, to which are fused rows of flat copper fins. Condenser tubes are brazed to the header plate. The unit will withstand



125 lb. per sq. in. steam pressure. Units are self-cleaning, due to their straight, flat construction.

Air is circulated over the heating unit by means of a motor-driven fan. The largest unit has a ½-hp. motor. Thermostatic control is provided extra.

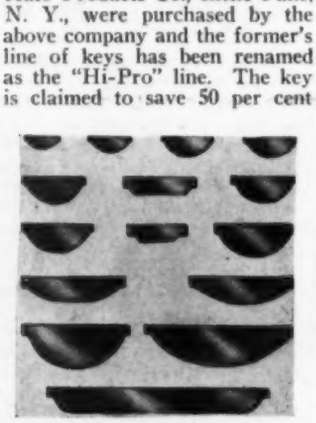
Units are light in weight and can be suspended from steam mains. The largest unit weighs 125 lb. and occupies a space of less than 3 cubic feet.

— 309 —

Keys, "Hi-Pro"

Morton Manufacturing Co., East Broadway & Hoyt St., Muskegon Heights, Mich. [Vol.70,p.680]

The business, good will, and patents of the former Dyett Auto Products Co., Little Falls, N. Y., were purchased by the above company and the former's line of keys has been renamed as the "Hi-Pro" line. The key is claimed to save 50 per cent



of the labor required in fitting and will not rock or roll in the shaft. It can be removed from the shaft without injuring it by driving a chisel underneath.

Hi-Pro keys are available in thicknesses from $\frac{7}{64}$ to $\frac{3}{8}$ in., and in lengths from $\frac{11}{32}$ to $1\frac{5}{16}$ in. The depth of the semi-circular portion ranges from 0.141 to 0.485 inch.

— 310 —

Keystock, Offset

Rockwood Manufacturing Co Indianapolis, Ind. [Vol.70,p. 221]

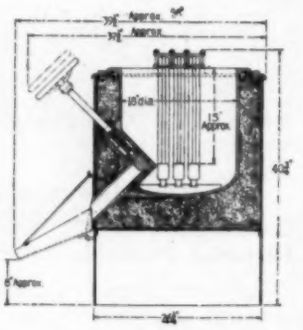
This assortment of offset keystock in 2 ft. lengths consists of 23 stock sizes, thus assuring wide interchangeability of pulleys and gears for any given shaft diameter. With this assortment, any millwright can mount pulleys, sprockets, couplings, and gears quickly and economically, regardless of the keyseat variations by means of keys sawed to length from the stock bars. These lengths are sold by individual bars, and also in convenient packaged assortments.

— 311 —

Melting Pot, Bottom-Pouring, Type R.P.

General Electric Co., Schenectady, N. Y. [Vol.70,p.837]

The type RP melting pot is particularly applicable in cases where it is impractical to ladle and where large quantities of metal are handled. The pot is suitable for use in railway shops and automotive factories for the



casting of babbitt bearings. It is designed for melting lead, babbitt, tin, solder, type metal and similar alloys, except spelter or zinc, at temperatures not exceeding 950 deg. F. Automatic control can be furnished.

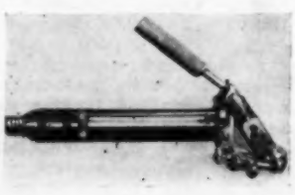
Advantages claimed are: The heat is generated in the metal, affording quick heating and low radiation loss; heating units are easily replaceable; maximum heating rate is obtainable without overheating, and the pot is safe and economical.

— 312 —

Mica Undercutter, 1929 Model

Ideal Commutator Dresser Co., Sycamore, Ill. [Vol.70,p. 337]

Space only 3½ in. wide is required for the operation of the mica undercutter known as the Model 1929. It is understood that when this device is used no time need be spent in dismantling brushes, brush boxes, or



brush rigging. Other advantages are that it will not jump or chatter.

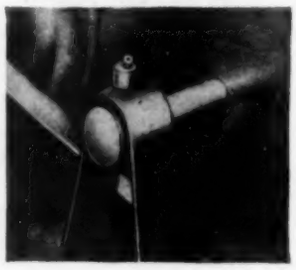
The distance from the saw to the rotary guide can be adjusted to the width of the average small copper bar, thus permitting the guide to be used when cutting the second slot, after cutting the first by hand. The entire roller guide assembly can be rotated so as to permit easy replacement of the cutters. Next to the saw is a depth gage so that the actual depth of undercutting can be measured instantly. Power is received through a flexible shaft direct-connected to the motor.

— 313 —

Oilhole Drive Fitting

Alemite Manufacturing Co., 2650 N. Crawford Ave., Chicago, Ill. [Vol.70,p.684]

This drive fitting for closing open oil holes prevents drippage and product spoilage. It comes in two parts, a reverse, feather-edge bushing, which is driven into the open oil holes by a special drive tool, and a nipple with dirt-proof ball check valves is forced into the bushing by means of another special drive tool. The bushings are made



in $\frac{1}{64}$ in. sizes from $\frac{1}{8}$ to $\frac{1}{2}$ in. in diam. Special bushings are made for countersunk holes and for thin housings. The completed oil hole fitting permits lubricating the bearings by means of a high-pressure oil or grease gun.

— 314 —

Optical Device, Ouellet

A. F. Ouellet, 454 East 134th St., New York, N. Y. [Vol.70, p.71]

For use in immediate, personal attention of minor eye injuries, this optical device shown was developed. It is a small, five-power magnifying mirror, 1 in. in diam., with a wire holder for attaching to the finger. In

use the mirror is clamped to the little finger of the left hand, as shown in the illustration, the thumb and forefinger being used to keep the eyelids back, while the particle is removed with the other hand by means of a folded paper cut to a point. The action is observed with the eye that is being treated, and besides magnifying the eye, the mirror also enables light to be reflected where needed.

— 315 —

"Plymetls," Aluminum and Duralumin

Haskelite Manufacturing Corporation, Chicago, Ill. [Vol.70, p.372]

Aluminum and duralumin faces have been attached permanently to "Haskelite" plywood, the resulting materials combining the strength and light weight of plywood with great resistance to impact, abrasion, and fire. A new glue process developed by the company provides an almost unbreakable bond between the wood plies and the aluminum or duralumin faces. These "Plymetls" can also be adapted to insulating purposes by providing them with cores of balsa wood or other insulating materials.

— 316 —

Probe, Surgical, Electro-Magnetic, "Magneprobe"

V. Mueller & Co., Ogden Ave., Van Buren & Honore Sts., Chicago, Ill. [Vol.70,p. 454]

In most cases particles of iron and steel can be removed quickly from an injured eye in the industrial first-aid station by the use of the "Magneprobe," an electro-magnetic steel probe. The instrument was developed

by the First-Aid Department of the Hawthorne Works of the Western Electric Co., Inc., and is being manufactured and marketed under license by the above company, surgical instrument maker. This instrument is about the size of an ordinary lead pencil. One end is sharpened to a point for removing particles from the eye and the other is flattened for use in cases where the fragment has penetrated into the flesh. With ordinary care the probe will retain its magnetic strength indefinitely. As it is made of

rust-resisting steel, it may be sterilized repeatedly without injury.

— 317 —

Pump, Hand-Transfer, Fireproof, "Trahern"

American Safety Equipment Co., Detroit, Mich. [Vol.70,p.875]

A hand-transfer pump, which is vapor-proof, fireproof, and explosion proof, is being manufactured by the George D. Roper Corp., Rockford, Ill., and distributed by the above company. To eliminate the danger occasioned by static electricity, and to make the pumping action safe, this pump is made of materials that are non-ferrous, non-

static, and non-corrosive. The pump is equipped to be fitted on steel drums with 1½ or 2 in. bung screw opening, and an attachment adapts it for ¾ in. bung-screw openings in the end of drums.

The principal parts are the collapsible suction pipe with packing gland, bung screw independent of the pump, the discharge pipe equipped with a ball check valve, anti-drip discharge nozzle to fit cans or containers from 1 to 5 gals., and a return drip bowl to return excess liquid to the drum. With a ¾ in. bung-screw connection, a flexible copper hose is furnished to go on the end of the suction pipe and reach to the bottom of the drum. A drip bowl is provided. The whole equipment may be removed quickly and easily.

— 318 —

Rivet Display Card

National Rivet & Manufacturing Co., Milwaukee, Wis. [Vol.70,p.911]

A display and sample card for rivets has been prepared by the above company. This card carries a group of seventeen brass, copper, and aluminum rivets. They are of standard sizes, in types suitable for automotive, aeronautical and industrial purposes. This card should be of use as a ready reference in drafting rooms.

— 319 —

Scale, Counting, Small Parts

Toledo Scale Co., 270 Madison Ave., New York, N. Y. [Vol.70,p.685]

Designed specifically for counting small pieces, this scale with a capacity up to 40 lb of work is small, compact, and accurate, and is of the bench type. It has sufficient sensitivity to register even a small screw.

The chart on the scale has

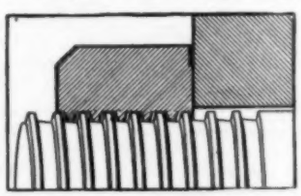
merely the words "under" and "over," either side of the zero mark. There are three pans, the weighing scoop on the platform, and the two balancing pans. The right-hand pan has a ratio of 99 to 1, and the other a ratio of 9 to 1. To get the number of parts in hundreds, sufficient parts are put into the right-hand pan so that the indicator approaches zero. To get the number of tens, more parts are taken from the scoop and placed in the left ratio pan until zero is reached. The total number of parts is the sum of these counts plus the pieces left over.

— 320 —

Screw and Nut, "Threadlock"

Dardelet Threadlock Corporation, 120 Broadway, New York, N. Y. [Vol.70,p.413]

In this new form of locking screw-thread the thread angle approximates that of the Acme with the difference that the space is considerably wider than the thread, and that the bottom of the thread is at an angle with its axis, the high side or large



diameter being toward the end of the bolt.

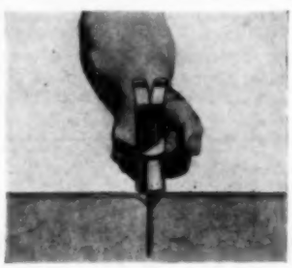
When the nut seats on the work, the conical surfaces are forced into closer contact and the material of the nut is stressed within its elastic limit until the side, or abutment, faces of the threads are in contact. The nut is then under stress, and is locked to the screw by the friction of the inclined surfaces. The locking action so produced is effective at any point along the threaded length of the screw. The nut can, however, be released readily with a wrench and can be used repeatedly.

— 321 —

"Screwnail"

Parker-Kalon Corporation, 190 Varick St., New York, N. Y. [Vol.70,p.533]

Greater holding power than is possible by means of the ordinary nail may be obtained by the use of a "Screwnail," when fastening sheet metal to wood. In many instances, it does away with the necessity for punching or drilling holes in the sheet metal. Furthermore, the countersunk head can be driven flush so that an unsightly projection is not left. This device is driven like a nail and holds like a



screw, because the hardened spiral thread forms a thread in the metal burr and in the wood, thus securely fastening the two pieces.

— 322 —

Signaling Device, "Wonder KodeKall"

Schwarze Electric Co., Adrian, Mich. [Vol.70,p.566]

Thirty different stations or persons can be called by means of the "Wonder KodeKall." This device is simple to install and to operate. The telephone operator sets a small dial at the combination number for the person desired, and the plunger is pushed down. The KodeKall operates, causing the correct buzzers, bells or horns to sound

three times in succession. The device is neatly furnished throughout and occupies less than 6 in. of space. It can be used on systems consuming up to 500 watts, when used with a relay on either a.c. or d.c. current, or without a relay when the consumption is below 100 watts.

— 323 —

Stand for Oil Drums, Steel

Pollard Brothers Manufacturing Co., 4035 N. Tripp Ave., Chicago, Ill. [Vol.70,p.570]

This all-steel stand for cradling drums on their sides, while emptying the contents, is equipped with rollers as shown, and therefore may be shifted from place to place. It is clean and fireproof, and is of the cor-

rect height so that a 5-gal. pail can be placed under the tap to draw the material. Casters are provided on the upper ends of the legs to carry the drum so that it may be rotated until the tap is in a position for pouring. The two end sections are arc-welded, and the lengthwise angles are riveted. The frame is made of 1½x1½x⅛-in. angles.

— 324 —

Tanks, Paint, Pressure-Feed

Paasche Airbrush Co., 1909 Diversey Parkway, Chicago, Ill. [Vol.70,p.721]

This standard line of stationary pressure paint tanks for automobile and large finishing production consists of one-piece, pressed steel, leaded containers with full-size covers held on by clamps operated by levers. Each clamp is adjustable with washer shims for correct tension and,

once set, tightens uniformly. Air-motor agitators, or hand agitators, are available for each size, as desired.

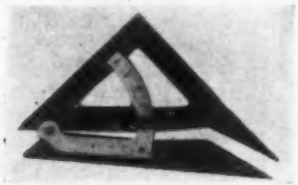
The tanks are made in the following sizes and dimensions: 60 gal., 24 in. high x 36 in. in diam., 32 gal., 18 in. in diam., 20 gal., 18 in. in diam., 12 gal., 12 in. in diam., and 6 gal., 12 in. in diam. Refill tanks of leaded steel with covers are also available.

— 325 —

Triangle, Protractor, Adjustable, "New Facila"

E. S. Brown, Garrow St., Auburn, N. Y. [Vol.70,p.376]

Apart from setting definite angles with the protractor, this device may be used for reproducing lines at haphazard angles, and their complements, on all classes of drawings and sketches. It is made in 7-, 10-, and 12-in. sizes, does not soil easily, and may be washed when necessary.



The stout, transparent celluloid body has a self-centering, ivory-grained celluloid protractor of large size, all parts being firmly secured by rivets or screws. The engine-divided protractor has large half-degree divisions. The narrow piece may be laid against a T-square and the right angle swung about it for drawing right angles in any position.

— 326 —

Torch, Blow, "Sprayit"

Electric Sprayit Co., Inc., 320 East Colfax Ave., South Bend, Ind. [Vol.70,p.955]

No pumping, priming, nor preheating is necessary to operate this torch. A blue flame is produced by simply turning the valve and applying a match. The torch is suitable for burning kerosene. Due to a complete pressure break-up of the fuel, correct combustion takes

place with absence of carbon deposits. The torch may be attached to any air supply. It is interchangeable with the agitator type "Electric Sprayit Gun" on the compressor unit.

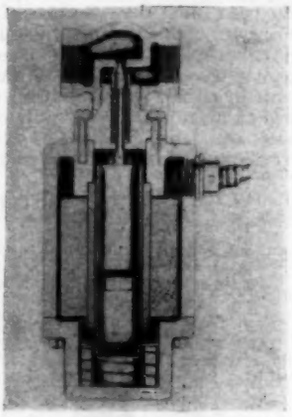
— 327 —

Valves, Solenoid

Electric Valve Manufacturing Co., 68 Murray St., New York, N. Y. [Vol.70,p.876]

Automatic control of oil, water, and air can be obtained by means of this packless solenoid valve, which may be governed by a thermostat, pressure regulator, or float switch. As a special application, this valve can be supplied for pickling operations.

This solenoid valve can be operated direct from the light circuit. Three models are built, the first in sizes from ¼- to ½-in. pipe sizes for 90 lb. per sq.in.; the latter two from ¾- to 3-in., pipe sizes, mainly for low pressures, particularly as the size increases.



INDEX OF MANUFACTURERS

American Section

— A —

No. Page

Acme Electric Welder Co.,
5621-23 Pacific Blvd., Huntington Park, Los Angeles, Calif.
"Hot-Spot" welders 130 98

Air Reduction Sales Co.,
342 Madison Ave., New York, N. Y.
Airco-Davis-Bournonville "Camograph" plate cutting machine, No. 4 .....166 103

Ajax Flexible Coupling Co.,
Westfield, N. Y.
Flexible coupling, Type C 246 115
Heavy-duty coupling 247 115

Alemite Manufacturing Corporation,
2650 N. Crawford Ave., Chicago, Ill.
Oil hole drive fittings.....313 123

Allen-Bradley Co.,
286 Greenfield Ave., Milwaukee, Wis.
Bulletin 709 starter 286 119
Bulletin 701 A.C. contactor....295 119

American Broach & Machine Co.,
Ann Arbor, Mich.
Horizontal hydraulic broaching machine, No. 0 .....136 99
Hydraulic broaching machine, type V-4, 4-ton 137 99

American Can Co., Equip. Div.
120 Broadway, New York, N. Y.
"Canco" press with double-pawl clutch 109 94

— A — (Continued)

No. Page

Anderson Die Machine Co.
Bridgeport, Conn.
Slotting attachment for "Anderson" dial tapper 128 98

Apex Machine Co.,
Dayton, Ohio.
Full-floating toolholders 226 113

Armstrong Bros. Tool Co.,
311 N. Francisco Ave., Chicago, Ill.
Spring-type cutting-off tool 90 90

Asquith & Son, S. A.
2514 Sunset Blvd., Los Angeles, Calif.
Metal cutting and piercing machine, 12-inch 118 95

Automatic Nut-Thread Corporation,
3617-19 N. 8th St. at Rising Sun Ave., Philadelphia, Pa.
"Threadnut" No. 3 automatic nut-tapping machine 124 96

Automotive Maintenance Machinery Co.,
816 W. Washington Blvd., Chicago, Ill.
"Ammco" drill press vise 26 81

Avey Drilling Machine Co.,
Cincinnati, Ohio
Berjo drilling machine vise 230 114

— B —

No. Page

Babcock & Wilcox Tube Co.,
85 Liberty St., New York, N. Y.
"Enduro" KA 2 stainless steel ..299 122

Barrett Company, Leon J.,
Worcester, Mass.
Centrifugal oil extractor washer and dryer 170 103

Barrett-Cravens Co.,
1328-1342 W. Monroe St., Chicago, Ill.
"Red Band" lift truck 188 108

Bastian-Blessing Co.,
240 East Ontario St., Chicago, Ill.
"Rego Leader" oxy-acetylene welding outfit 263 118

Besly & Co., Charles H.
118-124 N. Clinton St., Chicago, Ill.
"Titan Steel-Bac" abrasive disk 71 80

Bignall & Keeler Machine Works of the N. O. Nelson Manufacturing Co.,
Edwardsville, Ill.
Duplex pipe threading machine, No. 12 .....126 97

Black & Decker Manufacturing Co.,
Towson, Maryland
Electric handsaws 232 109

Blackhawk Manufacturing Co.,
Milwaukee, Wis.
"Chief" socket-wrench sets.....228 114

B *(Continued)*

Blanchard Machine Co., Cambridge, Mass.
Segmental grinding wheel for No. 10 surface grinder..... 72 88

Bonney Forge & Tool Works Allentown, Pa.
No. 33 double-end box wrench set 229 114

Bowlby Air Devices Co., 1600 Fairview Ave., Wichita, Kan.
Vise, air, operated.....155 102

Box Crane & Hoist Corporation, Janney & E. Ontario Sts., Philadelphia, Pa.
Type LHR electric traveling crane 186 107

Bradford Machine Tool Co., 657-671 Evans St., Cincinnati, Ohio.
Horizontal automatic drilling machine 12 79
Drilling and tapping machine for radial airplane engine crankcases 17 80
Three-way cylinder block reaming machine 18 80
Special automatic horizontal drilling machine 21 80

Brandt Engineering Corporation, 71 West 45th St., New York, N. Y.
Non-oxidizing furnace 182 106

Brown & Sharpe Manufacturing Co., Providence, R. I.
No. 3 automatic gear-cutting machine 27 81
No. 35 plain cylindrical grinding machine 35 83
No. 1 motor-driven universal grinding machine 37 83
Radius and angular wheel-truing attachment 69 87
Dresser for stepped grinding wheels 70 87
No. 2 plain and universal "standard" milling machines..... 95 92
No. 4A universal and No. 4B plain "standard" milling machines.. 98 92
Nos. 0, 1, and 2 motor-driven, wire-feed screw machines....156 102
No. 740 dial indicator set.....207 110
Rule depth gage 210 111
No. 616 rule depth gage.....212 111
No. 756 toolmakers' clamp.....232 114
Improved No. 306 flexible steel rule 235 114

Brown, E. S., Garrow St., Auburn, N. Y.
"New Facila" universal adjustable protractor triangle 325 123

Buckeye Portable Tool Co., Dayton, Ohio.
"Hercules" portable air tools.... 58 86

Buffalo Forge Co., P. O. Box 985, Buffalo, N. Y.
"Lowboy" and "Highboy" industrial unit heaters.....307 123

Bullard Co., Bridgeport, Conn.
Improved vertical turret lathes. 79 88

Burgess-Parr Co., Moline, Ill.
"Illium," corrosion-resistant alloy 302 122

C

Canton Foundry & Machine Co., Canton, Ohio.
Improved alligator shears.....115 95

Carborundum Co., Niagara Falls, N. Y.
Lapping compounds 73 88

Central Alloy Steel Corporation, Massillon, Ohio.
"Enduro" KA 2 stainless steel..299 122

C *(Continued)*

Chicago Pneumatic Tool Co., Chicago Pneumatic Building, 6 E. 44th St., New York, N. Y.
Boyer riveting hammer.....145 101
"Hicycle" nut runners and grinders 148 101

Cincinnati Bickford Tool Co., Oakley, Cincinnati, Ohio.
Sliding head "Direct-Drive" upright drills, 21 and 24-inch... 7 78
"Direct-Drive" upright, cylinder block chamfering machine... 19 80

Cincinnati Grinders Incorporated, Cincinnati, Ohio.
Heavy-duty cylindrical grinder, 24 in. x 36 in. x 28 ft..... 36 83

Cincinnati Planer Co., Cincinnati, Ohio.
"Hypro" planer, 96 x 96-inch....105 94
Openside "Hypro" planer, 96-inch.106 94

City Machine & Tool Works, 1517-1531 East Third St., Dayton, Ohio.
Gear burnishing machine..... 31 82
"Peerless" pneumatic tooth chamfering machine 33 83

Cleveland Automatic Machine Co., Ashland Ave., Cleveland, Ohio.
"Camite" tungsten-carbide cutting metal 300 122

Coats Machine Tool Co., Inc., 110-112 W. 40th St., New York, N. Y.
No. R-25 "Elasticometer" spring tester 217 111

Cochrane-Bly Co., Rochester, N. Y.
Automatic high-speed cutoff machine 153 102

Colonial Supply Co., 217 Water St., Pittsburgh, Pa.
K. & S. pocket radiation pyrometer 184 106

Condit Electrical Manufacturing Corporation 883 Summer St., South Boston, Mass.
Type A-30 across-the-line starter.289 119

Consolidated Machine Tool Corporation of America, Rochester, N. Y.
"Betts-Bridgeford" extra-heavy roughing lathe, 36-inch..... 74 88

Cook Co., Asa S., Hartford, Conn.
Automatic bolt and nut assembling machine 161 103

Covel-Hanchett Co., Big Rapids, Mich.
Nos. 700 and 800 production-type vertical surface grinders. 34 82

Craley, C. C. Manufacturing Co., P. O. Box 192, Shillington, Pa.
Improved "Master Toolmaker" for drilling jigs, 14 x 20-inch.. 25 81

Curtis Pneumatic Machinery Co., St. Louis, Mo.
Timken-equipped air compressors 304 123

D

Dardelet Threadlock Corporation, 120 Broadway, New York, N. Y.
Bolt and nut.....320 123

Davenport Machine Tool Co., 167 Ames St., Rochester, N. Y.
Redesigned Model B five-spindle automatic screw machine.....157 102

Davis & Thompson Co., 57th Ave. & Mitchell St., Milwaukee, Wis.
Horizontal multi-spindle drilling machine 20 80
No. 2-B continuous-type rotating milling machine 100 93
Type "CC" automatic self-opening diehead 129 98

D *(Continued)*

Dayton Rubber Manufacturing Co., Dayton, Ohio.
Cog-belt, V-type 248 116

Defiance Machine Works, Defiance, Ohio.
Improved No. 6 horizontal boring machine with faceplate drive.. 1 77
No. 8-4 special, extra-heavy, 4-spindle, cylinder-sleeve, boring machine 2 77
Two-Way horizontal boring machine 3 77

Detroit Alloy Steel Co., Foot of Iron St., Detroit, Mich.
"Dasco" air-hardening tool steel.301 122

E

Electric Sprayit Co., Inc., 320 E. Colfax Ave., South Bend, Ind.
"Sprayit" blow torch.....325 123

Electric Hand Saw Co., Seattle, Wash.
"Howland" electric handsaw...201 109

Electric Valve Manufacturing Co., 68 Murray St., New York, N.Y.
Solenoid valves 327 123

Electrocon Corporation, 6 Varick St., New York, N. Y.
"Davey" portable dynamic balancing equipment 204 110

Esterbrook Steel Pen Manufacturing Co., Camden, N. J.
No. 8 beam compass.....233 114

Excelsior Tool & Machine Co., East St. Louis, Ill.
No. 26 automatic four-wheel grinding and polishing machine 45 82
No. 19 ball-bearing lever punch.119 95
No. 25-D double-spindle polishing and buffing machine.....175 105

De Walt Products Corporation, Leola, Lancaster Co., Pa.
"Wonder Metal Worker" saw..152 102
Junior "Wonder Worker" electric woodworking machine....197 103

Diamond Machine Co., Providence, R. I.
20-Inch motor grinder..... 50 85

Dreis & Krump Manufacturing Co., 74th St. & Loomis Blvd., Chicago, Ill.
"Chicago" 14-Gage all-steel squaring shear 117 95

Eastern Screw Machine Corporation, Truman & Barclay Sts., New Haven, Conn.
"H & G" feed pusher for multiple-spindle automatic screw machines 158 102

Eclipse Interchangeable Counterbore Co., Detroit, Mich.
Quick-adjustable-collar toolholder 227 113

Edwards, A. V., 16 Broad Terrace, Bloomfield, N. J.
Ball-bearing mortiser 196 106

Electric Arc Cutting & Welding Co., 152 Jeliff Ave., Newark, N. J.
"Dualarc" 300-ampere two-operator welding outfit.....256 117
"Dualarc" two-operator welding outfit 256 117

Electric Controller & Manufacturing Co., 2700 E. 79th St., Cleveland, Ohio.
Time-current acceleration relay.285 119

Electric Valve Manufacturing Co., 68 Murray St., N. Y.
Solenoid valves 227 106

F

No. Page

Fairbanks, Morse & Co.,
Chicago, Ill.
"Flex-Mor" V-belt drive 249 116

Farrel-Birmingham Co.,
344 Vulcan St., Buffalo, N. Y.
"Sykes" 19-foot gear generator. 29 81

Federal Press Co.,
Elkhart, Ind.
Non-repeat clutch-control mechanisms for punch presses.....110 94

Federal Products Corporation,
Providence, R. I.
Direct-reading comparator 208 111
Model 80 Jr., dial indicator 214 111

Foley Saw Tool Co., Inc.,
9 No. E. Main St., Minneapolis, Minn.
Model G-109 automatic saw grinder 38 83
Model G-111 automatic circular saw grinder 48 83

Forbes & Myers,
172 Union St., Worcester, Mass.
Diemakers' high-speed grinders. 55 86

Forsberg Manufacturing Co.,
Bridgeport, Conn.
"Bon-Ton" No. 4 hacksaw frame.234 114

Foster Machine Co.,
Elkhart, Ind.
"Fastermatic" Nos. 1-, 2-, 3-, and 4-F automatic chucking machines 141 100

Frew Machine Co.,
124 W. Venango St., Philadelphia, Pa.
No. 0 duplex horizontal drill... 11 79
Elliptic chuck for vertical turret lathes 85 90
No. 2 duplex hand miller..... 99 93

G

Gardner Machine Co.,
Beloit, Wis.
Hand-operated swinging worktable for grinders..... 66 87
No. 3-CB polishing lathe.....173 105

Gaterman Manufacturing Co., W.
Franklin & 15th Sts., Manitowoc, Wis.
No. 5 tapper.....122 96

No. Page

Gears and Forgings, Inc.,
Cleveland, Ohio.
Extra-heavy roller-bearing, herringbone-gear speed reducer..239 115

General Electric Co.,
Schenectady, N. Y.
Enameling furnace 178 106
Hydrogenated copper brazing furnace 180 106
Type AD air drawing oven....181 106
Compensator of high-interrupting capacity 279 119
Compensators for use in gaseous atmospheres 281 119
Time-delay undervoltage devices.282 119
Nos. TC-121 and TC-131 temperature overload relays 284 119
Power-failure warning relay...285 119
Starters for small a.c. motors...287 119
Oil-immersed across-the-line switch 288 119
Small across-the-line starter....292 119
Radial switches for field rheostats 293 119
Combined motor control switch.294 119
Model RP bottom-pouring melting pot 311 123

Giddings & Lewis Machine Tool Co.,
Fond du Lac, Wis.
Combination side and end milling head 103 93

Gifford-Brown Sales Co., Inc.,
1 Broadway, New York, N. Y.
"Electrair" Nos. 3 and 6, electrically-operated mechanical hammers 146 101

G

(Continued)

Gisholt Machine Co.,
Madison, Wis.
Improved static balancer.....205 110

Gleason Works,
1000 University Ave., Rochester, N. Y.
"Hypoid" gear generator, 60-inch 28 81

H

Hall Machine & Tool Co.,
116 Chestnut St., Providence, R. I.
Bench forge 179 106

Haskelite Manufacturing Corporation,
Chicago, Ill.
Aluminum and duralumin "Plymetls" 315 123

The Henry & Wright Manufacturing Co.,
Hartford, Conn.
Dieing machine, 75-ton 143 100

Higgins Manufacturing Co., J. C.,
2228-2238 Kettner Blvd., San Diego, Calif.
Improved pipe bender 139 99

High Speed Hammer Co., Inc.,
Rochester, N. Y.
Model R-53 sensitive drilling machine 10 77

Hill-Curtis Co.,
Kalamazoo, Mich.
Extra-wide "Rite-Speed" polishing and buffing lathe.....172 105
"Rite-Speed" double-spindle polishing lathe 176 105

Hisey-Wolf Machine Co.,
Cincinnati, Ohio
Exhauster equipment for grinding wheels 65 87
"Texdrive" buffing and polishing machine 174 105

Howell Electric Motors Co.,
Howell, Mich.
Type CI "Red Band" brushless, single-phase motor 273 119

Hutto Engineering Co., Inc.,
515 Lycaste Ave., Detroit, Mich.
Model "MJ" horizontal, heavy-duty cylinder grinder 40 83
Model MP naval gun grinder... 47 83

Hydraulic Press Manufacturing Co.,
Mount Gilead, Ohio
"H-P-M" 100-ton hydraulic embossing press 108 94

I

Ideal Commutator Dresser Co.,
Sycamore, Ill.
"E-Z" wire stripper 238 114
Fuse puller 297 122
1929 Model commutator mica undercutter 312 123

Ideal Industrial Machinery, Division of Consolidated Concrete Machinery Corporation,
Cincinnati, Ohio
Combined tumbling and pickling machine 150 101

Independent Pneumatic Tool Co.,
600 W. Jackson Blvd., Chicago, Ill.
"Thor" pneumatic rod grinder.. 61 86
Thor "Kick-Out" nut-driving attachment 149 101

Ingersoll-Rand Co.,
11 Broadway, N. Y.
Multi-vane pneumatic grinder.. 60 86

J

J-B Engineering Sales Co.,
New Haven, Conn.
"Mansaver" automatic tapping machines 121 96

Janette Manufacturing Co.,
556-558 W. Monroe St., Chicago, Ill.
Speed-reducing power unit.....243 115

Jarvis Co., Charles L.,
Gildersleeve, Conn.
"Niedhammer" screw driving machine 147 101
Style P quick-change chucks and collets 221 113
"Midget" tapping device 224 113

Jones & Lamson Machine Co.,
Springfield, Vermont
Grinder for automatic diehead chasers 39 82
"Fay" 24-inch automatic lathe.. 80 89
"Hartometer" thread gage 209 111

Jones Foundry & Machine Co., W. A.,
4401 W. Roosevelt Rd., Chicago, Ill.
Star flexible coupling 245 115

Jones Machine Tool Works, Inc.,
5300 Landsdowne Ave., Philadelphia, Pa.
Aluminum ingot scalping machine 83 90

K

Kearney & Trecker Corporation,
Milwaukee, Wis.
Special gear milling machine... 30 82

Kelley-Koett Manufacturing Co.,
Covington, Ky.
"Keleket" X-ray apparatus 219 111

Kent Machine Co.,
Cuyahoga Falls, Ohio
Kent 4-inch dial-feed drilling machine 14 79

Kent-Owens Machine Co.,
958 Wall St., Toledo, Ohio
Buffing and polishing machine.. 46 83
Combination hand- and power-feed milling machine 91 91
Double-spindle opposed-feed milling machine 101 93

King Works,
Detroit, Mich.
Interchangeable punches and punch retainers 112 94

Kingsbury Machine Tool Co.,
Keene, New Hampshire
Circular-type multi-spindle drilling and tapping machine..... 13 79

Kinney Iron Works,
Los Angeles, Calif.
Ball-bearing swing-frame grinder 62 83

Kling Bros. Engineering Works,
1300 No. Kostner Ave., Chicago, Ill.
Type B high-speed grinders..... 52 85

L

Landis Machine Co.,
Waynesboro, Pa.
Type F "Landmatic" diehead... 86 90

Landis Tool Co.,
Waynesboro, Pa.
Type AB 16-inch crankpin grinder 41 83

Langelier Manufacturing Co.,
Arlington, Cranston, R. I.
Multiple drilling machine with power feed 5 77
Multiple-spindle continuous drilling machine 15 79
Improved automatic drilling units 22 80
No. 6 HS 11 swaging machine..169 103

L (Continued)

Lewis-Shepard Co.,
Watertown Station, Boston, Mass.
Portable revolving crane.....187 107
Corrugated pressed-steel skid platforms 193 108

Lidgerwood Manufacturing Co.,
775 Lidgerwood Ave., Elizabeth, N. J.
"Tugmore" capstans 194 108

Lincoln Electric Co.,
Colt Road and Kirby Ave., Cleveland, Ohio
Type W water-cooled carbon-electrode holder 266 118
Type T electrode holder.....267 118
Safety push button 280 119
Safety - type across - the - line starter 290 119

Linley Bros. Co.,
581 Fairfield Ave., Bridgeport, Conn.
No. 10 noiseless rotary rivet spinning machine 168 103

Littell Machine Co., F. J.
4125 Ravenswood Ave., Chicago, Ill.
No. 5 punch press feed 111 94

Long & Allstatter Co.,
Hamilton, Ohio
Straight-side tie-rod press.....107 94

Ludlum Steel Co.,
Watervliet, N. Y.
"Enduro" KA 2 stainless steel..299 122

Lufkin Rule Co.,
Saginaw, Mich.
Radius gages 212 111

M

Marburg Bros., Inc.,
90 West St., New York, N. Y.
"Thiel" precision die filing and sawing machine 162 103

Millers Falls Co.,
Millers Falls, Mass.
Electric hammers and accessories 144 101

Moline Tool Co.,
Moline, Ill.
Model R-600 radiator-section boring, facing, and tapping machine 4 77
No. 114-U "Hole-Hog" multiple drill 6 77

Monarch Machine Tool Co.,
Sidney, Ohio
High-speed lathe 76 88

Moraine Products Co.,
Dayton, Ohio
"Durex" oil-retaining bearings..250 116

Morrison Machine Co.,
Paterson, N. J.
Types A.R.U. and A.R.P. helical-gear right-angle speed reducers 240 115

Morse Chain Co.,
Ithaca, N. Y.
Stock chain drives 252 116

Morton Manufacturing Co.,
East Broadway & Hoyt St., Muskegon Heights, Mich.
"Hi-Pro" keys 309 123

Muehlmatt, A.,
Lion Bldg., Fifth & Elm Sts., Cincinnati, Ohio
No. 1 sensitive tapping machine.123 96

Mueller & Co., V.,
Ogden Ave., Van Buren & Honore Sts., Chicago, Ill.
"Magneprobe" electro-magnetic surgical probe 316 123

M (Continued)

Murchey Machine & Tool Co.,
Detroit, Mich.
Types P & G screw-machine die-heads 223 113

N

National Acme Co.,
Cleveland, Ohio
"Namco" opening dies 222 113
"Namco" opening dies, collapsing taps 225 113

National Automatic Tool Co.,
Richmond, Ind.
Model A 13H adjustable, hydraulic, multi-spindle drilling machine 8 77

National Machine Tool Co.,
Racine, Wis.
No. A-5 "Handnib" combination drill rod cutter and nibbler..120 95

National Rivet & Manufacturing Co.,
Foot of Park Place, Milwaukee, Wis.
Rivet display card 318 123

Newark Gear Cutting Machine Co.,
69 Prospect St., Newark, N. J.
No. 0 gear cutter sharpening machine 32 82

Niagara Machine & Tool Works,
Buffalo, N. Y.
Slip-roll former, 3-inch.....163 103

Niles Gear Co.,
111 Broadway, New York, N.Y.
"Maag" Type ASH-1 rapid gear-grinding machine 42 83

Noble & Westbrook Manufacturing Co.,
Hartford, Conn.
Special rotary graduating machine 164 103
Rapid-production strip marking machine 165 103

Norma-Hoffmann Bearings Corporation,
Stamford, Conn.
Ball and roller bearings.....251 116

Norton Co.,
Worcester, Mass.
Type S floorstand grinders 24- and 30-inch 49 85
Radial-engine cam grinder.... 43 83

Nukem Products Corporation,
70 Niagara St., Buffalo, N. Y.
Suspended-frame pickler 151 101

O

Ohio Gear Co.,
1333 East 179th St., & St. Clair Ave., Cleveland, Ohio
Wormgear speed reducers.....242 115

Oliver Machinery Co.,
Grand Rapids, Mich.
No. 51 unit-type motor head-stock lathes 77 88
High-speed bandsaw, 36-inch..195 108
No. 191 tilting-arbor, motor-driven saw bench.....198 109

Tinius Olsen Testing Machine Co.,
500 N. 12th St., Philadelphia, Pa.
Improved centrifugal balancing machine 206 110
Improved Nos. 2A and 3 motor-driven ductility testing machines 215 111
Lever-weighing ductility testing machine 216 111
Strain-gage extensometer 220 111

Oster Manufacturing Co.,
Cleveland, Ohio
No. 602 bar and pipe cutting-off machine 142 100

O (Continued)

A. F. Ouellet,
454 East 134th St., New York, N. Y.
Optical device 314 123

Oxweld Acetylene Co.,
30 E. 42nd St., New York, N. Y.
Type MP-101 "Prest-O-Weld" medium - pressure acetylene generator 262 118
No. 21 high-strength bronze welding rod 269 118

P

Paasche Airbrush Co.,
1969 Diversey Parkway, Chicago, Ill.
Pressure-feed paint tank.....324 123

Parker-Kalon Corporation,
190 Varick St., New York, N. Y.
"Screwnail" 321 123

Parker Rust-Proof Co.,
2177 E. Milwaukee Ave., Detroit, Mich.
"Bonderite," primer for iron and steel 303 122

Peacock & Son,
913 Collings Ave., West Collingswood, N. J.
Lathe dog 88 90

Peerless Electric Co.,
Warren, Ohio
Flexible-shaft grinder 63 86
No. 2 universal portable pipe threading machine 125 97

Henry Pels & Co., Inc.,
90 West St., New York, N. Y.
Type ME-10 combination punch, shear, angle and bar cutter and coper 114 95

Perry, Harry M.,
638 North Main St., Los Angeles, Calif.
"Belt-Slacker" Idler Pulley....254 116

Pittsburgh Instrument & Machine Co.,
1026 Reedsdale St., Pittsburgh, Pa.
Steel tape repair outfit.....237 114

Pittsburgh Producers Supply Co.,
Pittsburgh, Pa.
Roller - bearing - equipped shop truck 192 108

Pollard Bros. Manufacturing Co., Inc.,
4034 N. Tripp Ave., Chicago, Ill.
Die or tool truck.....190 108
Pick-up truck 191 108
Steel stand for oil drums.....323 123

Porter-Cable Machine Co.,
Syracuse, N. Y.
Type B-6 irregular sander.....167 103
Portable saw 200 109
Core-print gage 203 110

Porter-McLeod Machine Tool Co.,
Hatfield, Mass.
Double-backgeared screw-cutting lathe, 16-inch 78 88

Potter & Johnston Machine Co.,
Pawtucket, R. I.
No. 4-D automatic chucking and turning machine 140 100

Producto Machine Co.,
Bridgeport, Conn.
Two-spindle automatic cam miller 102 93

Progressive Tool Co.,
429 N. LeRoy St., Fenton, Mich.
"Olofson" precision grinder... 56 86

— R —

	No.	Page
Reed-Prentice Corporation, Worcester, Mass.		
No. 2 vertical milling machine..	96	92
No. 3 vertical milling machine..	97	92
Resilient Terminals Co., 10th & Oak Sts., Oakland, Calif.		
"Unicord" extension lamp set ..	298	119
Reynolds Machine Co., Massillon, Ohio		
No. 2 heavy-duty screw-driving machine	159	103
Robinson Machine Co., Muskegon, Mich.		
"Midget" plain air hose coupling	305	123
Rockford Machine Tool Co., Rockford, Ill.		
Redesigned quick-change, geared-head "Economy" lathes, 12-, 14-, and 16-inch	75	88
Rockwood Manufacturing Co., Indianapolis, Ind.		
Offset keystock	310	123
Rogers & Co., Samuel C., 191-205 Dutton Ave., Buffalo, N. Y.		
Type W reversible knife grinder.	44	83
Roller-Smith Co., 233 Broadway, New York, N. Y.		
Type FD pyrometer	185	106
Type EAF free-handle, Inclosed circuit breakers	276	119
Type EAF small circuit breakers	278	119
Type HEA-3 polyphase ammeter	296	122
Geo. D. Roper Corporation, Rockford, Ill.		
"Trahern" fireproof hand-transfer pump	317	123
Ross Manufacturing Co., 2209 Ashland Rd., S. E., Cleveland, Ohio		
Wheel-truing tools for cylindrical grinding machine	68	87
Rotor Air Tool Co., 5905 Carnegie Ave., Cleveland, Ohio		
No. E-5 pneumatic drills	23	81
No. D-3 high-production grinder	59	86
Ryerson & Son, Inc., Joseph T., 16th & Rockwell Sts., Chicago, Ill.		
Small combination shear, punch and coper	113	95

— S —

	No.	Page
Standard Electrical Tool Co., 1938 W. Eighth St., Cincinnati, Ohio.		
Double-spindle buffing and polishing lathe	177	105
Stark Tool Co., Waltham, Mass.		
Motor drive unit	84	90
Starrett Co., L. S., Athol, Mass.		
No. 666 thickness gage stock ..	213	111
Stecher Co., Charles, 2452 Greenview Ave., Chicago, Ill.		
Multiple-unit automatic drilling and tapping machine	16	79
Steinle Turret Machine Co., Madison, Wis.		
Heller "High Efficiency" cold metal saws	154	102
Stephens-Adamson Manufacturing Co., Aurora, Ill.		
Type JES variable speed reducer	244	115

— S —

(Continued)

	No.	Page
Sterling Electric Motors, Inc., Los Angeles, Calif.		
Air-cooled buffers and grinders.	51	85
Steubing-Cowan Co., Cincinnati, Ohio		
"Red Streak" lift truck	189	108
Stow Manufacturing Co., Inc., Binghamton, N. Y.		
Flexible-shaft units	64	86
St. Paul Welding & Manufacturing Co., 174 W. 3rd St., St. Paul, Minn.		
"Torit" automatic gas-air torch.	264	118
Sundstrand Machine Tool Co., Rockford, Ill.		
"Rigidmil" vertical reciprocating- and rotary-table milling machines	92	91
Rigidmil No. 30 milling machine	93	91
Shauer Machine Co., Cincinnati, Ohio.		
Electric drill	24	81
Electric screw driver	160	103
Schwarze Electric Co., Adrian, Mich.		
"Wonder KodeKall" signaling system	322	123
Seneca Falls Machine Co., Seneca Falls, N. Y.		
Automatic work driver	89	90
"Lo-Swing" Model U automatic lathe	81	89
Sentry Co., Taunton, Mass.		
Diamond block for hardening steel	183	106
Shaler Co., Waupun, Wis.		
Spring winder	236	114
Shaw-Crane-Putnam Machine Co., Inc., Div. of Maxwell, Manning & Moore, Inc., Fitchburg, Mass.		
Putnam billet peeler	82	90
Shields Machine Tool Co., 410 West St., New York, N. Y.		
Plain and universal milling machines	94	92
Smith, Inc., Winfield H., Springfield, N. Y.		
No. 4D "WHS" speed reducer..	241	115
Superior Machine & Engineering Co., 1930 Ferry Park, Detroit, Mich.		
Two-spindle vertical milling attachment for hand milling machines	104	93
Suter, Alfred 200 Fifth Avenue, New York, N. Y.		
Universal and plain testing machines	218	111

— T —

	No.	Page
Thomson Electric Welding Co., Lynn, Mass.		
Portable spot welder, 25-kilowatt	131	98
Power drive attachment for Thomson spot welder	132	98
Model 502 cowl welder	133	98
Power miter welder	134	98
Model 375, 48-inch throat seam welder	135	98
Thomson Manufacturing Co., 60 India Street, Boston, Mass.		
Victor "Super Drill" bench-type drilling machine	9	77
Toledo Pipe Threading Machine Co., Toledo, Ohio.		
No. 999 pipe threading machine.	127	97

— T —

(Continued)

	No.	Page
Toledo Scale Co., 270 Madison Ave., New York		
Small-parts counting scale	319	123

— U —

	No.	Page
U. S. Electrical Tool Co., Cincinnati, Ohio		
Grinder, 6-inch	53	85
Die block surface grinder, 24-inch	57	86
Improved wheel guard for "U.S." grinders	67	87

— V —

	No.	Page
Van Dorn Electric Tool Co., Cleveland, Ohio.		
Bench grinder, 6-inch	54	85

— W —

	No.	Page
Wagner Electric Corporation, 6400 Plymouth Ave., St. Louis, Mo.		
Type 57 RA rubber-mounted motor	270	119
Small standard vertical motor..	272	119
Type RAR rubber-mounted motor	275	119
Wallace, J. D. & Co., 134 S. California Ave., Chicago, Ill.		
"Workace" radial saw	199	109
Wallace Supplies Manufacturing Co., 1310 Diversey Parkway, Chicago, Ill.		
Nos. 6-C and 7-C pipe benders..	138	99
Weber Machine Corporation, 33 S. Water St., Rochester, N. Y.		
"Perfection" wire stripper	171	103
Wedge Lock Tool Co., 549 W. Randolph St., Chicago, Ill.		
Multiple-bit toolholder	87	90
Weldit Acetylene Co., Detroit, Mich.		
Styles C and G "Gasavers"	265	118
Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa.		
Gas-engine-driven arc welder, 300-ampere	259	117
Welding generator	260	117
Single-operator arc-welding generators, 300- and 400-ampere.	261	117
Metal-electrode holder	268	118
Totally-inclosed fan-cooled squirrel-cage motor	271	119
Type SK totally-inclosed fan-cooled motor	274	119
Circuit breaker, 15-ampere	277	119
Class 11-200 line starter	291	119
Wilson Welder & Metals Co., Inc., Hoboken, N. J.		
Gas-engine-driven welder	255	117
Type S gas-engine-driven welder	257	117
Washburn Shops, Worcester Polytechnic Institute, Worcester, Mass.		
Accelerating clutch	253	116
Williams & Co., J. H., Buffalo, N. Y.		
"Vulcan Superior" chain pipe vise	231	114

— Y —

	No.	Page
Young Radiator Co., Racine, Wis.		
Unit heaters	308	123

— Z —

	No.	Page
Zeh & Hahnemann Co., 182-200 Vanderpool St., Newark, N. J.		
No. 4-4B selective-die punch press and nibbler	116	95

CONTENTS OF THE REVIEW PAGES

European Edition

	No.	Page
Boring Machines	**1-6**	**131**
Horizontal	1	131
Special-purpose	2-6	131
Drilling Machines	**7-18**	**132**
Upright	7-8	132
Radial	9-10	133
Horizontal	11-12	133
Special-purpose	13-18	133
Gear Cutting and Testing Machines	**19-22**	**134**
Hobber	19	134
Generator	20	135
Worm miller	21	135
Testing machine	22	135
Grinding Machines	**23-41**	**135**
Cylindrical	23-25	135
Internal	26-27	136
Surface	28-32	136
Universal	33-34	137
Special-purpose	35-39	137
Attachments	40-41	138
Lathes	**42-54**	**139**
Engine	42-44	139
Turret	45-51	139
Special-purpose	52-54	140
Milling Machines	**55-62**	**141**
Horizontal	55-57	141
Vertical	58-61	141
Attachment	62	142
Planers and Shapers	**63-66**	**142**
Planers	63-65	142
Shaper	66	143
Presses	**67-69**	**143**
Shearing Machines	**70-73**	**144**
Other Machines	**74-88**	**144**
Bending	74	144
Cutting-off	75	144
Filing	76	145
Hammer	77	145
Marking	78	145
Riveting	79	145
Sawing	80	145
Screw Machines	81-83	145
Tapping	84	146
Miscellaneous	85-88	146
Balancing, Gaging, and Testing Equipment	**89-96**	**147**
Balancing	89	147
Gaging	90	147
Testing	91-96	147
Small Tools	**97-100**	**148**
Transmission Equipment	**101-107**	**149**
Speed reducers	101-102	149
Miscellaneous	103-107	149
Miscellaneous	**108-116**	**150**

Boring Machines

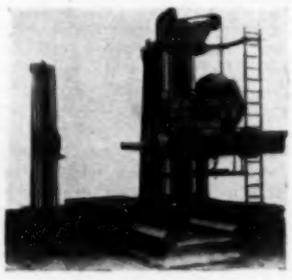
— 1 —

Boring Machine, Horizontal, Large

Selson Engineering Co., Ltd., Hatton Garden, E.C., London, England. [Vol.70,p.146E]

Collet & Engelhard, Offenbach, Germany, manufacture this boring machine in an improved form. This machine has a column of the same general type as the firm's other machines, but has feeds and rapid traverse of the whole column in the direction of the spindle, the work being mounted on a table which slides on V's so that the table has feeds and rapid traverse in a direction opposite the spindle. The bed is extended to the other side of the table so that a steady can be mounted which also has adjustment in and out as regards the spindle.

The motor is mounted direct on the spindle carriage and movement is controlled by push button. A wide range of spindle and faceplate speeds are provided. Further, if desired, the faceplate may be arranged so as to have a horizontal travel of 2 or 3 in., thus permitting milling cutters to be mounted on the faceplate. A double range of feeds is now provided. Further, this machine may be arranged so that the horizontal and vertical feeds can be set in separately or together, an advantage when milling curved faces. The feed of the boring bar is 51 in., with an extension of 29½ in. The vertical movement of the boring spindle is 78¾ in., and the horizontal travel of the table, 118 in. The table is 79x126 in., the length of the main bed being 244 in. The largest boring diameter is 39¾ in., and the largest facing diameter, 49 in. The spindle speeds range from 2 to 150 r.p.m., with eight feeds.



— 2 —

Boring Machine Jig, No. 2

Selson Engineering Co., Ltd., Charles St., London, E.C., England. [Vol.69,p.305E]

This No. 2 jig boring machine, built by Henri Hauser, S.A., Bienne, Switzerland, has a capacity of 8x8in., and can be used for the production of jigs, gages, and fixtures for precision work. Like the other models, it depends upon the use of micrometer screws. The drums are adjustable on the screws so that they can be set to zero at the start of the work. End play is eliminated by the use of weights. The firm guarantees that the maximum error of displacement of the slides does not exceed 0.00015 in., while the tools supplied with the machine are interchangeable within 0.0001 in. The divisions of the standard scales have no error exceeding 0.0002 inch.

The vertical slide can be used for center punching, as well as for drilling. The boring tool

and the toolholder are co-axial. A 30-power microscope is used for controlling and measuring, and the goniometric microscope enlarges 20 times for angle measurement.

The arbor is bored through to take a collet, chuck, or boring tool, and its drilling capacity is up to $\frac{3}{32}$ in., but larger holes can be bored by a boring tool. Fast and slow speeds are obtained from the countershaft or by a variable-speed motor. The vertical travel of the drilling spindle is $2\frac{3}{8}$ in. The circular table used is $9\frac{7}{8}$ in. in diam. and is divided into half degrees, a vernier movable in either direction enabling readings to be made to 2 min. The rectangular accessory table is $11\frac{7}{16}$x8 in. The maximum height between table and slide is 4 inches.

Overall dimensions, 32x44x54 in. high. Weight 820 lb. net.

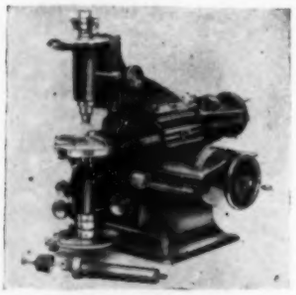
— 3 —

Boring Machines, Jig and Locating

Selson Engineering Co., Ltd., Charles St., Hatton Garden, London, E.C., England. [Vol. 69,p.345E]

The above company is the agent for jig boring machines made by Henri Hauser, S.A., Bienne, Switzerland. The range includes the No. 00 and No. 1 sizes, in both of which the maximum diameter drilled is $\frac{1}{4}$ in., the vertical travel of the spindle being $1\frac{1}{2}$ in. Drums are graduated in 0.001 in. with direct reading on the drums and verniers of 0.0001 inch.

The larger machine has a capacity of 4x4 in. The slides are moved by screws, the upper slide bearing a holder for the various tools, including the microscope, punching device,



and drilling head. The screws are controlled by adjustable graduated drums. The index is also adjustable and a correction device is available for dealing with any errors in the pitch of the screw. On each slide graduated scales with movable indexes are provided.

The toolholder has a steel sleeve adjusted by rack and pinion, and accommodating a 30-power goniometric microscope. Angles to 1 min. can be read. The punching device fits in the steel sleeve in the toolholder. The drilling head has sensitive feed by lever and provides a maximum speed of 3,000 r.p.m., the spindle taking wire chucks with a capacity up to $\frac{1}{4}$ inch.

The universal table may be $2\frac{3}{4}$ or 4 in. in diam., and is carried in a steel socket $1\frac{3}{4}$ in. in diam. The faceplate bears three jaws for securing the work, and, by means of a divided plate at the bottom of the spindle and vernier, the rotation of the table can be read to 1 min. The rectangular table provided for large work has a surface 6x10 in., and is fixed in front of the bed.

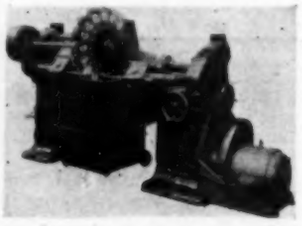
The smaller machine has a capacity of $2\frac{3}{4}$x$2\frac{3}{4}$ in., and, like the larger machine, is intended for instrument work, for use in watch and clock factories, and similar shops. All kinds of measurement can be done, including linear, angular, verification of contours, and the centering of work.

— 4 —

Boring Machine, Piston, Multiple Spindle, Automatic, Double-Headed

Alfred Herbert, Ltd., Coventry, England. [Vol.70,p.48E]

The machine is used for boring and reaming the gudgeon-pin holes in aluminum or cast-iron pistons of 77 and 75 mm. diam., the diameter of the gudgeon-pin holes being 20 mm. Each hole is drilled, rough-reamed, and finish-reamed to a limit of 0.005 in., and 0.001 in.



eccentricity with the outside diameter of the pistons. An output of four pistons per min. is obtained. Fourteen pistons are mounted at a time on the automatic indexing head and two are machined simultaneously at each operation. Each head has four spindles, the right-hand head having two drill and two rough reamers and the left-hand head two drills and two finishing reamers. The reamers travel twice as fast as the drills, and are stopped automatically before withdrawal. The revolving indexing fixture is located by means of guide bars.

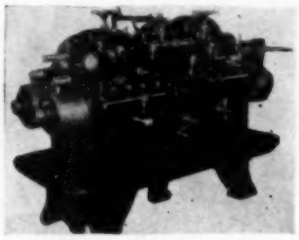
The feed of the heads is by cams, the main camshaft also driving the indexing mechanism for the rotating indexing fixture. The machine is driven by a 5-hp. motor running at 1,460 r.p.m., and equipped with a centrifugal clutch. The machine has an automatic trip. It is also provided with a pump and portable tanks for lubricant.

— 5 —

Boring Machine, Four-Spindle, Semi-Automatic

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.70,p.82E]

Mars-Werke, A. G., Nürnberg-Doos, Germany, are the manufacturers of this boring machine for which the above company is the British agent. The machine is a four-spindle, semi-automatic for machining



crank-levers, connecting-rods, and similar products, the various operations including drilling, reaming, facing, recessing, thread-cutting, milling, etc., being done practically simultaneously.

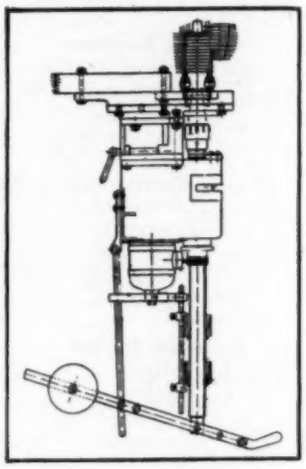
The four headstocks are arranged in pairs, two spindles on each side, with the work placed between them. Each headstock has cross-adjustment, through rack and pinion, and fine adjustment for the tools is provided on the spindles. The two rear spindles are bored to take a drawback device. The spindles work in pairs, moving up to the job and returning. The rear right spindle carries at the back an adjustable stop which brings the whole machine to rest. Auxiliary vertical spindles are available for drilling and milling. Drive may be by motor, but usually is by belt.

— 6 —

Boring and Honing Machine, Cylinder, Portable

Dowding's Machine Tool Co., Ltd., Vauxhall, S.E., England. [Vol.70,p.96E]

This Schuchardt & Schutte reboring and honing machine is suitable for reconditioning motor car cylinders and has been redesigned so that both boring



and honing can be effected at the same time. It is placed in any convenient manner, the boring head lining up with the cylinder by the aid of a conical arbor.

A vertical motor placed at the back drives the spindle through gearing, two speeds being provided by means of a sliding sleeve and key. For boring, the spindle speed is 20 r.p.m. and for honing 200 r.p.m. Automatic feed is provided for the boring tool. The honing tool is reciprocated by a hand lever and the stroke is adjustable to stops. With this machine, cylinder blocks having up to eight bores may be machined, the range being from $2\frac{1}{4}$ to 5 in. in diam., and maximum depth 18 in.

Drilling Machines

— 7 —

Drilling Machine, Vertical, Four-Spindle

Kitchen & Wade, Halifax, England. [Vol.70,p.8E]

This motor-driven drill is suitable for automotive, aeronautical, electrical, and similar industries. The bed carries two standards supporting a deep cross-slide on which the four drilling heads are mounted. Each head is independently driven and has three speeds, 650, 350, and 260 r.p.m., respectively, and three feeds, 70, 90, and 110 cuts per in. The machine is driven by a 20-hp. constant-speed motor mounted on a projection of the cross-slide and coupled direct to the

main horizontal driving shaft, motion being transmitted to the four vertical spindles by hardened steel and phosphor-bronze spiral gears running in oil.

The saddles have start and stop motion to the spindles and each is fitted with its own feed box. The spindles have positive automatic knock-off motion and a balance weight is provided so that when the drill has penetrated to the desired depth it withdraws itself automatically. Two special jigs, each in four sections, are bolted on the worktable, providing four fixture plates for setting up the work. Self-centering chucks on each jig plate grip the work. Brass bushings or ball bearings are provided in each bearing. The machine is 8 ft. 3 in. long by 5 ft. 3 in. wide, and 9 ft. 3 in. high.

Weight 5¾ tons net.

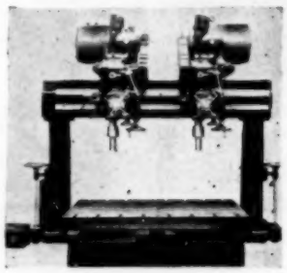
— 8 —

Drilling Machine, Crossrail-Type, Two-Spindle

W. Asquith, Ltd., Halifax, England. [Vol.70,p.189E]

The two drilling heads are independently adjustable along the crossrail by handwheels. The spindles are of high-carbon steel and of six-splined form, ground. They are bored No. 5 Morse taper and have a vertical feed of 18 in. Each spindle runs in a sleeve, fitted with double ball thrust and journal bearings.

The spindle speeds range from 240 to 35 r.p.m., obtained



through a variable-speed motor and double gears. Four rates of power friction feed are available, together with fine hand adjustment. The spindles are balanced and automatic trip motion is also provided. The maximum center distance of the two spindles is 7 ft., the minimum being 2 ft. 4½ in. Drive is by a 7½-hp. reversing motor mounted at the top of each slide.

The worktable in two parts is 7 ft. long overall and 5 ft. 8 in. wide. It has a traverse through the uprights of 3 ft. 5 in. Each part of the table can be separately adjusted under the crossrail to allow the drilling heads to operate on independent pieces of work.

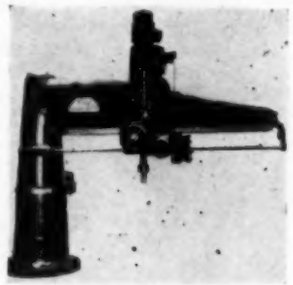
Floor space, 12 ft. 2 in. by 9 ft.; overall height, 10 ft. 3 in., and weight, 6 tons.

— 9 —

Drilling Machine, Radial Girder, Central Thrust, 8-Foot

Kitchen & Wade, Halifax, England. [Vol.70,p.85E]

This machine has been especially adapted for heavy-duty work and has a maximum radius of 8 ft. 1 in. and a minimum radius of 1 ft. 7 in. The maximum distance from the spindle nose to the floor line is 4 ft. 9½ in. The vertical driving motor is mounted direct on the spindle. The four spindle speeds range from 200 to 400



r.p.m. and the three positive feeds by gearbox vary from 83 to 115 cuts per in. The spindle is bored No. 5 Morse taper, its vertical feed being 18 inches.

The arm is of special section to prevent vibration in the long sides when work is being drilled at the maximum radius. Both fine hand and friction feed are provided and double gears on the saddle. The saddle can be quickly racked along the arm by handwheel and the usual mechanism and friction clutch engages the feed.

Weight 5¼ tons.

— 10 —

Drilling Machine, Radial, Girder, Motor-Driven

G. Swift & Sons, Ltd., Halifax, England. [Vol.70,p.118E]

Several plate and girder radial drills with vertical-motor drive direct on the saddle have been placed on the market, the range being 4 to 10 ft. radius. The minimum radius of the machine illustrated is 1 ft. 4 in. and the height admitted with the spindle in the top position is 4 ft. 3 in. One lever locks the saddle to

arm and the arm to the pillar. The arm swings through a complete circle. The 2-in. spindle is driven by a 5-hp. vertical motor. Drive is through spur gears of heat-treated, nickel-chrome steel. The spindle rotates on ball journal and thrust bearings and is six-splined, the nose being bored No. 4 Morse taper. The saddle moves on the radial arm on roller bearings. The six spindle speeds are approximately from 160 to 550 r.p.m., and the three rates of positive feed are 55, 75 and 100 cuts per inch.

The feed motion is of new design. The movement of a duplex ball handle brings the drill into contact with the work and continued movement puts on the friction feed, which is automatically applied. When the hole is drilled, movement of the ball handle in the opposite direction first disengages the power feed and then positively withdraws the drill. The pump circulates oil to all the working parts in the saddle.

Weight, without electrical equipment, 5,300 pounds.

— 11 —

Drilling and Reaming Machine, Horizontal, Semi-Automatic, Four-Spindle

Selson Engineering Co., Ltd., Coventry, England. [Vol.69,p. 248E]

This semi-automatic machine is for drilling and reaming holes from ⅛ to ⅝ in. in diam. in steel. The speeds are arranged for drilling at a cutting speed of 60 ft. per min., and reaming at 30 ft. per min., but they can be altered. Each spindle has a change of gear for drilling or reaming operations, thus permitting all the spindles to be used for drilling or reaming or any two for drilling and the others for reaming.

The spindles run continuously and are fed to the work by cams

which are arranged in sequence, giving each spindle a definite withdraw motion after drilling or reaming. The work is held in a quick-gripping attachment. Drive is by a three-speed cone pulley and two-speed countershaft, giving six speeds. A six-speed gearbox can be supplied, if required. The change from fast to slow is independent for each spindle. The spindles run in phosphor-bronze bearings and thrust is taken by ball bearings.

The maximum feed of the spindles is 2 in. The feed motion is positive with three changes. Fixtures are adjustable on the plates to suit the work, and an adjustable stop locates the position of holes to be drilled in bolts or shouldered shafts.

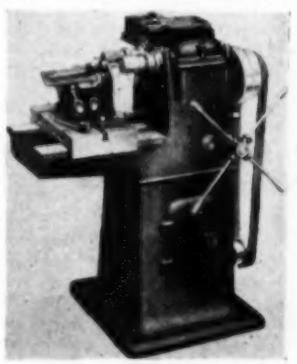
Weight, 5,000 pounds.

— 12 —

Drilling and Tapping Machine, Horizontal, Two-Spindle, "Orbel"

United Machine Tool Co., Ltd., Gray's Inn Road, London, W.C., England. [Vol.70,p.72E]

The above company is agent for the Orbel two-spindle drilling and tapping machine made by Muller & Montag, Leipzig, Germany. The machine is made in two sizes, to tap ⅜ and ¾ in.,



respectively, in steel. The two spindles are horizontal and the work is placed in a holder which can be swung against adjustable stops into two positions.

By means of a star handle the drill is fed through the work, which, on the return of the drill, is swung to the second position when the tap operates. The drills are guided in interchangeable bushings and the workholder is arranged to hold but not grip the work. Spindle speeds are arranged to suit and may run up to 6,000 r.p.m. for drilling. Facing and counterboring operations can be done by suitable tools in the chucks. Drive is by motor inclosed in the body and three-step pulleys, through gearing.

— 13 —

Drilling Machine, Horizontal, Three-Spindle, Long-Hole, Special

Craven Bros., Ltd., Manchester, England. [Vol.69,p. 235E]

This three-spindle, horizontal drill has been designed for drilling three long holes simultaneously in motor car and

similar parts. It will drill holes up to 1¼ in. diam. along shafts 30 in. long, the work being done by drilling half way up and then reversing the shaft in the fixed headstock and drilling the remaining length to meet the first half length.

Two heads are mounted on the bed, the fixed head carrying three rotating sleeves, with a chuck on one end to hold the work and collets at the other

end. The driving head at the other end is movable along the bed, the traverse being obtained by means of a drop worm. Quick traverse is also provided.

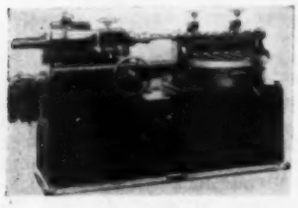
In front of the fast headstock is mounted a plate fitted with three hardened steel bushings, which act as guides for the drills. A handle operates the clutch for locking the three drill spindles. Three feeds are provided by the box at the right.

— 14 —

Drilling Machine, Horizontal, Special

W. Asquith, Ltd., Halifax, England. [Vol.69,p.249E]

This single-purpose machine is used for drilling, facing, and tapping cored holes in the ends of monoblocs. It can drill 1½-in. holes, and face up to 2 in. in diam. The drilling head is driven by a 3-hp. constant-speed motor through spiral gears. The



spindle has a horizontal traverse of 10 inches.

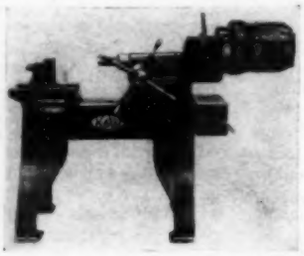
The feed motions, both ordinary and fine, are applied by hand. Reverse motion is provided for left-hand tapping. By means of a planed guide way in front of the head, a new piece of work may be moved into position on the jig as soon as the preceding one has been finished.

— 15 —

Drilling Machine, Horizontal, Swivelling-Head, Special

Kitchen & Wade, Halifax, England. [Vol.69,p.262E]

This motor-driven, swivelling-head, horizontal drilling machine is especially adapted for drilling holes ½ to 1½ in. in



diam. in angles, T's, channel iron, section rings, and tanks. The open form of the work support also accommodates large built-up structural members. The drilling head is in two parts, the top portion swiveling to any angle horizontally so that holes in awkward positions and in corners can be drilled.

The drive is by means of a flange motor and three-speed gearbox controlled by a vertical hand lever. The spindle is traversed by hand through a rack and pinion. The three spindle speeds available are 500, 360, and 280 r.p.m. A T-slotted slide carries an adjustable block with steel shoe for gripping the work.

— 16 —

Drill, Horizontal, Duplex, Special

Alfred Herbert, Ltd., Coventry, England. [Vol.69,p.293E]

This machine is particularly arranged for drilling eight cross holes in valve guides for automobile engines. These holes are 2½ mm. in diam. and are arranged in two rows of four each, the outside diameter of the valve guide being ⅜ in. with a ⅛-in. central hole. The two drills used are direct driven by electric motors and the feed is obtained from a cam motion, the two motors advancing and receding on slides. The time of the cycle for drilling eight holes is 9 sec., allowing 5 sec. for the actual cutting and 4 sec. for handling. The work is held vertically by means of a spring collet of the three-split type, controlled by capstan wheel.

The two drilling motors of ¾ hp. are mounted on slides set 135 deg. apart, and the drills are held by self-centering chucks at two different levels. A ¼-hp. motor is used for driving the

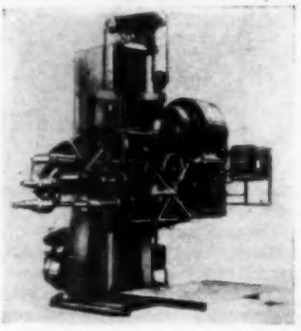
feed camshaft and the indexing motion. A single cam controls the two heads, and the drive to the cam is through a friction clutch, which trips if the load becomes excessive. The whole mechanism is arranged so that it will trip at the completion of a cycle or will work continuously as desired. Guide bushings for the drills are provided in the workholder, which indexes to 90 deg. Wick feed supplying oil to the various bearings is a feature.

— 17 —

Drill, Horizontal, for Large Drums

W. Asquith, Ltd., Halifax, England. [Vol.69,p.344E]

The motor-driven horizontal drills offered are for drilling steel drums ranging from 2 to 6 ft. in diam. Each head car-



ries an auxiliary spindle and is mounted on a vertical column carried on a traverse bed 3 ft. wide and 50 ft. long. With a single head a horizontal movement of 46 ft. may be obtained. Hand-operation and power movement by a 2 hp. motor are provided for the column and head. The spindle slide moves vertically on the column, controlled by handwheel, gears, and a screw. Stop brackets on the column provide for adjusting the spindle slides so that the auxiliary spindle is in position after drilling the hole. A horizontal pitching arrangement, carrying a lever-operated spring plunger, provides for locating one hole from the previous one.

The main drilling spindle is 3¼ in. in diam. in the driving part. Its horizontal traverse is 18 in. Four automatic feeds are provided, from 100 to 30 cuts per in. through a friction clutch. Six spindle speeds are available from 330 to 990 r.p.m. The auxiliary spindle has hand feed only, and is employed for chamfering and recessing. The two heads are identical in design and are independently driven by a 10-hp. variable-speed motor mounted on the spindle slide. Lubricant is supplied by means of a pump.

— 18 —

Drillheads, Adjustable, Light

Alfred Herbert, Ltd., Coventry, England. [Vol.70,p.19E]

Two- and four-spindle drillheads are available. The body of the tool is of aluminum and the gears are hardened, chrome-nickel steel. All parts are amply lubricated.

On the two-spindle model, the centers can be adjusted

from 1½ to 6 in. The collet chucks take drills from 1/32 to ½ in. A No. 2 Morse shank is provided.

Gear Cutting and Testing Machines

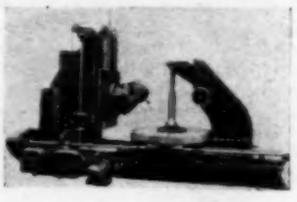
— 19 —

Gear Hobber, 13-Foot

Dawding & Dickinson, Greycoat St., S.W., London, England. [Vol.70,p.170E]

This automatic gear-hobbing machine is manufactured by Hermann Pfauter, Chemnitz, Germany, and will cut spur, worm and spiral gears, the capacity being up to 13 ft. in diam. by 50 in. wide; the maximum pitch cut is 30 module or nearly ¾ D.P., or 3¾-in. C.P. Spur gears can be cut with vertical down feed to the hobbing saddle, the work carriage remaining fixed in position on the bed. Wormwheels can be produced with radial feed, or by axial and radial feed. The machine is also used for spiral gears by means of the firm's differential drive and quadrant with change-gear system. Further, a special hobbing head is available for large spiral gears of small pitch and large tooth angle.

The hobbing head carries a



hardened axially-adjustable hob-spindle, and is mounted on its saddle on a swivelling base. The drive is taken from the main shaft through index change gears to the dividing worm shaft, hob and spindle thus rotating in correction relation.

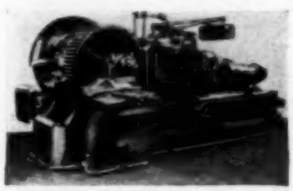
The machine has a special work arbor support, the table carriage being extended. A bracket, adjustable by hand-wheel for height, supports the work arbor, and for taking the cutting pressure on the gear blank, a roller support is also available. The hobbing feed can be adjusted by means of change gears, and for any set of change gears three different rates of feed may be obtained by the operation of a single lever. Both the hob saddle and the table carriage have quick power traverse.

— 20 —

Gear Generator, Spur, Double-Acting, Sunderland

J. Parkinson & Son, Shipley, England. [Vol.69,p.262E]

Spur gears up to 7 ft. in diam. by 15-in. face by 1¼ D.P. can be cut on this machine. In most respects, it is similar to the firm's No. 27 gear planer for double-helical gears, its capacity being the same. The machine has two fixed-length strokes, one for wheels with faces up to 15 in. and the other for faces up to 9 in., and it em-



bodies the Parkinson double-acting cutter box, which is built into the cutter slide. Here two cutters are employed, clamped back to back.

Most of the metal is removed by the roughing cutter, and the finishing cutter, having only to take light cuts on the sides of the teeth, retains its cutting edge much longer and gives a better finish. It is also possible to use faster feeds without overstressing the machine. The main motor is 12 horsepower.

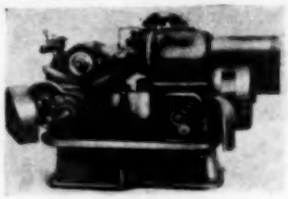
— 21 —

Worm and Thread Automatic, Nos. S.F. 1 and S.F. 2, Pfauter

Dowding & Dickinson, Greycoat St., Westminster, S.W., England. [Vol.69,p.303E]

These machines differ only in size. They have been developed by Herman Pfauter, Chemnitz, Germany, and have been placed on the market in the United States by the above company. Maximum worm diameter that can be cut on the S.F. 1 is 9⅞ in., and on the S.F. 2 is 11⅛ in. Maximum circular pitch at one cut by the former is 1½ and by the latter 2½ in. The speed can be changed by putting on different pairs of spur gears.

The cutter head is mounted on a swiveling base. Tilting of the cutter head is effected by a worm drive built into the upright. The spindle is adjustable axially, and its main bearing is adjustable radially. The work may be mounted between



cutters, on work arbors, in special collets, or in bushings with differential locking nuts. The end of the work opposite to the index head is supported by a tailstock. Travel of the table is effected through a leadscrew of large diam. and the axial thrust is taken by ball bearings. The feed drive is carried out by change gears, which can be disengaged automatically or by hand.

A coolant pump having 7-gal. delivery is furnished. Worms from 2 to 20 starts can be cut. Maximum length of the smallest diameter worm is 19½ in. in both cases, whereas for the largest diameter the length is 22 in. for the first machine and 26¾ in. for the second machine. Cutting speeds of from 30 to 81 r.p.m. are provided for the first, and from 25 to 76 r.p.m. for the second.

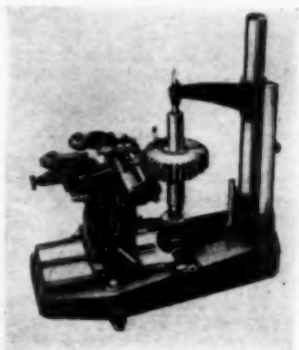
Floor space required: 67x75 in. and 71x79 in., respectively. Weights, 3,860 and 6,060 pounds.

— 22 —

Gear Tester

Dowding's Machine Tool Co., Ltd., Vauxhall, S.E., England. [Vol.70,p.113E]

Schuchardt & Schutte, Berlin, Germany, make this Zeiss instrument for testing the pitch, tooth spaces, tooth thicknesses, and eccentricity of spur, spiral,



worm, and bevel gears to within 0.0001 in. The pitch is measured by parallel measuring jaws without reference to eccentricity. The tooth spaces are gaged by a ball feeler, the eccentricity being determined similarly. The thickness of the teeth is also measured by comparison, by ball-shaped feelers.

The heavy base carries a vertically adjustable center for the work arbor. The measuring mechanism, ball feelers, parallel jaws, and indicators are carried on the measuring slide, which is in turn carried by a cross-slide. After each measurement, the gear is advanced one tooth by a ball-tipped index.

Spur gears up to 25-deg. pressure angles, 5 to 25 D.P., and to 16 in. in diam. can be measured, also spiral gears to 10 in. by means of parallel jaws. With ball jaws spur and bevel gears from 2½ to 25 D.P. and 16 in. in diam. and spiral and worm gears up to 10 in. can be measured. Within this range of pitch, spur and bevel gears can be tested for eccentricity up to 16 in. in diam. and spiral and worm gears up to 10 in. Indicator range, plus or minus 0.004 in., accuracy 0.0001 inch.

Grinding Machines

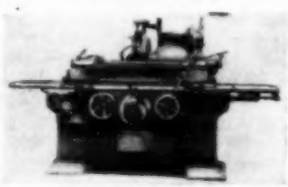
— 23 —

Grinder, Plain Cylindrical, "Naxos"

Selson Engineering Co., Ltd., Charles St., London, E.C., England. [Vol.69,p.292E]

This plain cylindrical grinder is intended for ordinary cylindrical grinding or wide-wheel grinding. Its capacity is 6½-in. swing, maximum grinding length 3 ft. 3 in., and the largest diameter admitted 3 in. The machine is driven by a single pulley and it may be coupled by belt to the lineshaft or to an electric motor carried on a pedestal. The table traverse is effected by an oil pump and cylinder, the speeds being variable up to 40 ft. per minute by infinite amounts.

The reverse lever is operated by hand or automatically through the adjustable dogs attached to the slide on the front



of the table. Hand traverse is effected by a handwheel. The reverse permits shoulder grinding to a fine degree of accuracy. The eight mechanical changes of work speed range from 58 to 428 r.p.m. The automatic micrometer cross feed is variable from 0.0001 to 0.002 in. per stroke of the table. The feed may also be hand-controlled by a micrometer dial. Provision is made for taper grinding up to 9½ deg., measured on the diameter. The wheelhead carries an 18-in. wheel, 4 in. wide, for cylindrical grinding. The speeds are 1,100 and 1,400 r.p.m. The hardened and ground spindle runs in adjustable phosphor-bronze bearings. The bed and table are heavily constructed to furnish great rigidity.

Power required is 7½ to 10 hp. Weight, 2¾ tons.

— 24 —

Grinding Machine, Cylindrical and Plunge-Cut, Hydraulic

G. H. Alexander (Machinery) Ltd., Birmingham, England. [Vol.70,p.71E]

The above firm is agent for a cylindrical and plunge grinder made by L. Loewe & Co., Berlin, Germany. In this machine the table drive, operation of wheel feed, and withdrawal of the tailstock center are effected

hydraulically. The machine will grind up to 5¼ in. in diam. with rests, or 10¾ in. in diam. without rests, maximum length depending on length of bed. It is made in four standard sizes, suitable for jobs up to 39¾ in. length with the smallest bed, and 98½ in. long with the longest bed. The grinding wheel is 31½ by 4¾ in. wide and the speeds are 760 and 894 r.p.m. Automatic feed is from 0 to 0.0039 in. Table feeds can be varied as desired from 0 to 2¾ in. The work has six speeds from 21 to 200 rev. per minute. Controls are placed within easy reach of the operator to permit high productivity.

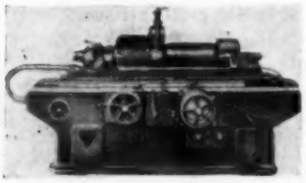
By means of a lever the wheel feed can be set to suit either cylindrical or plunge grinding. For the former the feed may occur either at both ends of the stroke or at one end only. The machine is push-button-controlled. The motor is built in and the water tank, with pump, is mounted on wheels. The power required is from 15 hp. upwards. On this machine cones can be ground, varying as a maximum, according to the length of bed, from 1 in 3 to 1 in 6 in ratio.

— 25 —

Grinder, Cylindrical and Plunge-Cut

S. G. Jones, Ltd., Brixton Road, London, S.W., England. [Vol.70,p.143E]

Fortuna - Werke, Stuttgart - Cannstatt, Germany, has designed this plunge-cut grinding machine in an improved form and it is now being sold in England by the above agent. The maximum grinding diameter is 10 in., and the maximum normal grinding length may be 24, 40, or 60 in., according to the length of bed. Grinding wheels up to 24x6 in. or 20x8 in. may be used, the maximum angles at which the table can be set being 10, 8, or 6 deg., according to the size of the machine. With



the internal grinding spindles, when used, the maximum depths that can be ground is 13, 19¾, and 20½ in. In each case 16 to 20 hp. is required. The Enor hydraulic drive has been applied to the table and work headstock to give any speed between 20 and 450 r.p.m., and any table speed between 0.03 and 40 ft. per minute.

When plunge-cut grinding, the table travel can be reduced to 0.2 in., the table then being oscillated at any speed up to the maximum of 40 ft. per min. Hydraulic cross feed is provided to the wheel head.

Plunge-cut grinding is effected independently of the table movement at any speed. The grinding spindle has axial thrust taken on double thrust ball bearings. The machine can be provided with a Hirth automatic measuring device for external work. This is of advantage on long and slender work to be finished in one operation.

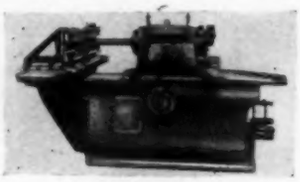
— 26 —

Grinder, Internal, Hydraulic

Selson Engineering Co., Ltd., Charles St., Halton Garden, E.C., England. [Vol.69,p.332E]

Naxos Union, Frankfort, Germany, build this hydraulic internal grinder, which is suitable for grinding cylinder bores. The maximum diameter ground is 7½ in., and maximum depth, 15¾ in. The standard spindle grinds bores from 2⅜ to 7½ in. to depths of 11¾ in. Special spindles grind depths to the full range.

The grinding wheel spindle has planetary motion and horizontal traverse. It runs in



phosphor-bronze bearings, ball bearings taking the thrust. Spindle speeds of 3,500 and 6,200 r.p.m. are available, the axial feeds ranging from 0.00008 to 0.0004 in. The chain-driven planetary motion is adjustable in diameter up to 2 in., and has four speeds from 40 to 100 r.p.m. Checking, gaging, and wheel dressing can be done without interfering with the adjustment.

All fast-running shafts are ball bearing mounted. Automatic reciprocation of the carriage is obtained by oil pressure at feeds from 0 to 40 ft. per min. Adjustable stops provide for automatic reversal.

The work table is adjustable both horizontally and vertically, and a special table will take up to 13¾ in. to the spindle center. The standard table is 39⅜ by 15¾ in., the longitudinal adjustment being 31½ in., vertical adjustment, 4 in., and height of table to center of planetary motion, 3 to 7 inches.

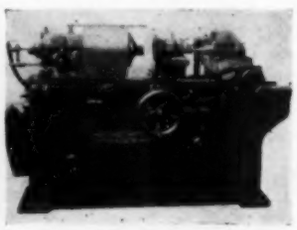
Power required, 3 hp., with dust exhausting system, 4½ hp. Floor space, 8 ft. 5 in. by 7 ft. 3 in. Weight 1¾ tons.

— 27 —

Grinding Machine, Internal and Face

Mayer & Schmidt, Offenbach, Germany. [Vol.70,p.80E]

For heavy work, this internal and face grinding machine with hydraulic table-drive and a device for face or plane grinding is built. The grinding head remains stationary while the headstock has a sliding motion. The headstock is adapted to take a three-jaw chuck, or any special work holder, and five speeds are provided, from 75 to 365 r.p.m. For grinding taper bores, the headstock can be swiveled through 15 deg. The table on



which the headstock is mounted can be operated both by hand and hydraulically. The speed of stroke, limited by the control stops, can be regulated from ⅜ to 256 in. per minute.

When the table reaches its extreme left-hand position, the rotary movement of the headstock shaft is automatically stopped and the cooling-water supply automatically cut-off. Reversing the control lever returns the table to grinding position, rotates the work and starts the water supply. For grinding the surface of a piece accurately relative to the bore, a plane grinding device is provided. The truing device enables both the internal-grinding and the face-grinding wheel to be dealt with. The machine can be used for work up to 9½ in. in diam., or up to 12¾ in. external diam. with the water-guard removed, and for grinding lengths up to 8⅜ in. The drive is by belt.

— 28 —

Grinder, Surface, Five-Side, "Naxos"

Selson Engineering Co., Ltd., Charles St., Hatton Garden, E.C., London, England. [Vol. 69,p.318E]

Naxos Union, Frankfort, through the above British agent is marketing a special machine for grinding five sides of an object. Surface grinding is done by a wheel on one side of the machine upright. On the other side a 14-in. segmental wheel, mounted horizontally and driven by a 10-hp. motor, can be swiveled around a vertical axis into positions 90 deg. apart, for grinding faces of objects parallel to the bed.

The table of the machine is 16 ft. 6 in. long by 6 ft. 6 in. wide, and is motor driven by rack and worm gear at two speeds, 20 and 30 ft. per min., is controlled by adjustable stops, or by hand. It has a clearance of 12 in. under the grinding wheel. The main spindle carries a 20-in. wheel, 6 in. wide,

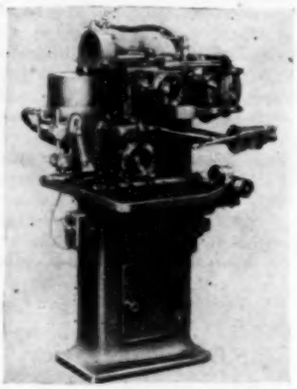
belt-driven by a 20-hp. motor. Downward feed is controlled by an index dial. Automatic cross feed ranges up to 1⅜ in. per reversal of table for the ordinary grinding head. The grinding wheel support can be adjusted to suit the height of the work and the cross rails carrying it can be raised and lowered by power. A sideways oscillating movement of ⅜ in. can be provided for the grinding spindle. Water is supplied to the wheel by means of a centrifugal pump.

— 29 —

Grinder, Surface, Ring and Disk, 8-Inch

Cromwell Engineering Co. (Coventry) Ltd., Coventry, England. [Vol.69,p.319E]

This machine grinds disks or rings up to 8 in. in diam. and having concave, convex or flat faces. The table will tilt 15 deg. in each direction. The work is carried on a magnetic chuck, which is adjustable for height, and is carried in a jaw casing. Pivoting about the driving worm center is controlled by an adjusting screw. The grinding wheel is mounted on a wheel slide, operated by a rack and pinion, and power operated by a link motion from a slotted disk



driven through worm gearing by a three-speed cone pulley.

The work table is driven by a two-speed cone pulley through a friction clutch operated by handle. A belt-driven centrifugal pump supplies water to the wheel through flexible piping. The machine is driven from a countershaft that also drives the jackshaft for the table and feed motions. The grinding wheel is 8 in. in diam. by widths up to ¾ in. The surface of the magnetic chuck is 8 in. in diam. and work up to 4 in. thick can be admitted with an 8 in. wheel. Weight 1,200 pounds.

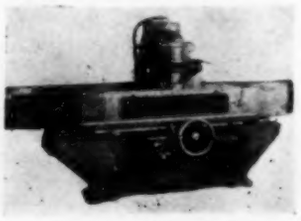
— 30 —

Grinding Machine, Surface, Hydraulically-Operated

Mayer & Schmidt, Offenbach, Germany. [Vol.70,p.104E]

This surface grinding machine has a segmental grinding wheel, vertical spindle, separate motors, and hydraulic drive. The bed and the under-frame for the grinding column are in one casting. The column for the grinding wheel is bolted to the underframe and the grinding head is guided on vertical slides of the column. The wheel driving motor is mounted on the column.

The movement of the grinding head is by hand or hydraulically. The feed can be controlled automatically at each end of the stroke between limits



of 0.004 mm. and 0.06 mm. (0.023 in.).

The table is also moved hydraulically, its speed being variable from 20 mm. to 5,000 mm. (16½ ft.) per min. It can be stopped and reversed in any position, and the feeds can be changed during the grinding operation.

The position of the grinding axis can be regulated by means of setscrews and a gage on the column. The driving motor for a segmental wheel 33 mm. diam. is 16 hp. The water tank is separate from the machine and the pump delivers 33 gal. per min. Operating levers are centralized. The machine is suitable for work up to 11¾ in. wide and is supplied with tables 19¾, 39¾, and 59 in. in length.

— 31 —

Grinding Machine, Surface

Soag Machine Tools, Ltd., Horseferry Road, London, S.W., England. [Vol.70,p.128E]

A grinding machine for cast iron, brass and steel has been introduced. A cup wheel rotates on a vertical axis, the flat ring surface uppermost. The wheel surface is on a level with the horizontal worktable. The

work is merely passed over the surface of the worktable and no clamping is necessary, so parts of any shape can be ground. Each half of the table may be adjusted vertically so that one side of the wheel can be used for rough grinding and the other side for finished grinding. The grinding spindle is adjusted vertically by a handwheel at the lower end of the spindle. The supporting members are exceptionally sturdy.

The standard machine has a low guide, or an auxiliary angle guide where high work fixtures must be finished. Drive is from lineshaft or by motor. The machine shown has a motor at the rear.

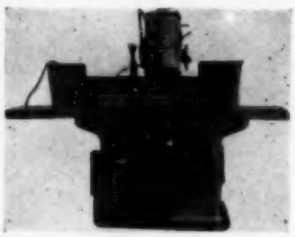
The machine is built in six sizes. The smallest carries a 6-in. cup wheel and has a table surface of 12x14 in., its net weight being 330 lb. The largest size has a 30-in. cup wheel and a worktable 39½x79 in., net weight being 3,500 lb. Allowance on castings for finishing on this machine is between 0.01 and 0.03 inches.

— 32 —

Grinder, Surface, Vertical-Spindle, Hydraulic, Motor-Driven

G. H. Alexander (Machinery) Ltd., Birmingham, England. [Vol.70,p.144E]

Arno Rein & Rülcker, Berlin-Halensee, Germany, manufacture the above machine which may be driven by belt or motor and has hydraulic table movement and feed. The machine carries 10-in. segmental or cup wheels, and is made in two sizes, the only difference being in the table movements which are 48 and 51 in., respectively. The corresponding working surfaces are 29½ and 39¾ in. by 7 in., the grinding width being 7½



in. The maximum distance between the table and a new grinding wheel, cup or segmental, is 11¾ inches.

Simplicity in handling, quick means of securing work, wide range of adjustment and self-contained measuring or gaging equipment are among the features. The table speeds can be varied up to 40 ft. per min., and the vertical feeds of the grinding spindle headstock at each movement or double movement of the table vary up to 0.002 inch.

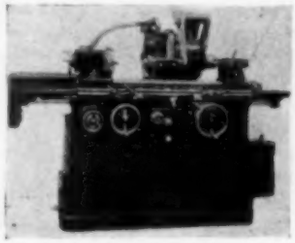
The grinding headstock is carried on an intermediate carriage on which it can be pivoted so as to grind either perfectly flat or slightly hollow. A measuring arm with "Minimeter" is placed at the left of the grinding wheel. An electrically-driven centrifugal pump supplies the coolant, and a wheel-truing device is mounted on the grinding headstock. The necessary magnetic chucks are available and also demagnetizing devices. The power required is about 7 hp. Net weight of the smaller machine 4,400 lb., and the larger machine 5,060 pounds.

— 33 —

Grinder, Hydraulic, Universal

G. H. Alexander (Machinery), Ltd., Birmingham, England. [Vol.70,p.97E]

This universal precision grinder is made by L. Loewe & Co., Berlin, Germany, and is sold in England by the above agent. The maximum diameter that can be ground with rests is 3⅛ in. and without rests, 9⅜ in., the maximum length being 23⅝ in. The machine may be driven by single pulley, or by a flange motor, and both the table and the work head have hydraulic drives. The headstock speeds range between 24 and 280 r.p.m., and the speed can be raised to 350 r.p.m. for grinding holes. The table feeds range from zero to ⅝ in., and



stops with fine adjustment are provided.

The work head swivels so that with an overhanging arbor holes can be ground. Grinding can be done between dead centers and the headstock also has a rotating spindle with a flange for taking chucks. The grinding wheel is 13¾ in. in diam. by 1⅜- or 2-in. face, the speed being 2,000 r.p.m. Wheel feed is hydraulic and varies from 0.0024 in. It may be operated either at both ends or at one end of the table stroke. The upper table can be swiveled through 8 degrees.

The internal grinding attachment is mounted on the wheel slide and is independent of the grinding wheel, so that, if necessary, work can be ground both inside and outside at one setting. Power required is 7½ horsepower.

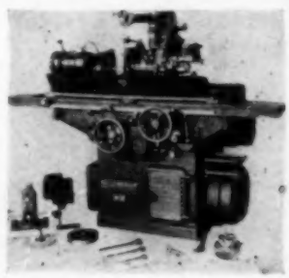
Floor space, 8 ft. 6 in. by 4 ft. 6 in.; weight 5,300 pounds.

— 34 —

Grinding Machine, Universal

Alfred Herbert, Ltd., Coventry, England. [Vol.70,p.169E]

L. Kellenberger & Co., St. Gall, Switzerland, is the manufacturer of this universal grinding machine intended for the quantity-production of cylindrical and conical work, both external and internal, for surface grinding, and also for tool grinding. For plain cylindrical grinding the maximum distance between centers is 29½ in., and the maximum diameter admitted



is 9¾ in. The maximum length for surface grinding is 39¾ in., and the maximum width 5½ in. The working surface of the table is 45½x5½ in., and the movement of the table by hand or automatically is 29½ in. The vertical travel of the spindle head is 7¾ in., and the cross travel 10½ inches.

The machine is available for direct electric drive by two built-in motors or drive by single pulley with a universal motor for the work drive. The grinding wheel used for cylindrical work is 9x1 in. and runs at 1,400 r.p.m. Its spindle is hardened, ground, lapped, and adjustable axially, ball bearings being fitted for the end thrust. The whole grinding head can be turned to a scale through 360 degrees.

Hand movement for the cross feed is arranged for both fast and sensitive adjustment with rapid return by hand lever. The table has nine speeds, in three series, three speeds being obtained from a gearbox and the remainder by belt. The upper worktable swivels to scale, with fine adjustment, and the lower table slides on V- and flat guides with automatic lubrication. The machine has been specially designed for wet grinding. A ball-bearing centrifugal pump supplies the coolant.

The internal grinding head is used by rotating the column. Similarly by rotating the column 90 deg. the machine is available for surface grinding. Tools may be ground between centers or in a universal gripping device, which is supplied.

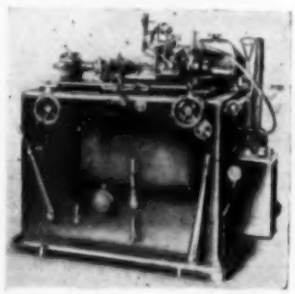
Weight 2,640 lb. net.

— 35 —

Grinding Machine, Screw Thread, Precision

Reishauer-Werkzeuge, A.G., Zurich, Switzerland. [Vol.69,p. 345E]

This precision thread-grinding machine is particularly suited for small right- or left-hand screw-threads of fine pitch. The



machine works automatically and one man can operate several machines. The threads can be ground either after previous naughing-out, or from the solid stock.

The maximum diameter of thread taken is 1⅛ in.; maximum length of thread ground,

2¾ in.; maximum length of work taken, 6 7/16 in.; maximum thread pitch ground, 11 turns to the inch, and minimum thread pitch ground, 80 turns to the inch. The maximum grinding wheel diameter is about 10 in.; minimum wheel diameter, 7¼ in.; speed of grinding wheel, 2,700 r.p.m.; speed of trueing wheel, 2,900 r.p.m.; maximum diameter of trueing wheel, about 2 in.; minimum diameter, 1½ in.; speed of spindle adjustable between 0.21 and 12 r.p.m.; constant return speed, 75 r.p.m.; and automatic wheel feed adjustable between 0.0025 mm. and 0.05 mm. on radius.

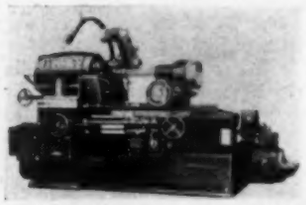
The degree of accuracy attainable is, on the diameter ±0.003 mm., on the pitch ±0.001 mm. on 10 mm. length of thread, and ±5 min. in the half-profile angular deviation. With the aid of the microscope, perfect cylindricity or, by suitable adjustment of the tailstock, any desired taper, are claimed for the machine. Grinding is effected axially so that error due to reversal with backlash is eliminated.

— 36 —

Grinding Machine, Cylinder, Aeroplane Engine

Soag Machine Tools, Ltd., Horseferry Road, London, S.W., England. [Vol.70,p.115E]

Wotan-Zimmermann-Werke, Chemnitz, Germany, build this machine which is modified from a standard type for dealing with airplane and automobile engine cylinders and sleeves, and similar work. In addition to internal grinding, it can also be used for face grinding at the same setting. The special feature is the workhead which has a large hollow spindle in which



the cylinder to be ground is placed. Work is introduced from the rear of the spindle and is held by a simple clamping arrangement which insures that it is concentric with the spindle itself and that the flange is at the correct right-angle position. Cooling water is introduced either from the rear or the front. The workhead is hydraulically driven and the speed can be adjusted.

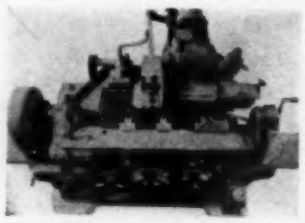
The bed contains the cylinder for the hydraulic drive to the table and also, at the right-hand side, an oil container for this drive. The hydraulic drive gives speeds from 1 to 40 ft. per min. The spindle bore is 12¾ in., the grinding depth, 15¾ in., and the net weight, 4½ tons.

— 37 —

Grinding Machine, Camshaft

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.70,p.116E]

This machine is available in two sizes, the only essential difference being in the length of camshaft taken, which for the smaller machine is 30 in., and for the larger machine 40 in. between centers. The machine works from a master camshaft made in one piece and hardened and ground, no dividing apparatus being necessary. An 18x1-in. wheel is used. The longitudinal movement of the table is hydraulically driven and the table can also be operated



by means of a handwheel. The work spindle is fixed on the swinging table, the drive being taken from the main spindle by means of spur gears. Four speeds are available.

The tailstock slides the full length of the swinging table, the center having quick adjustment. The grinding head has two speeds and the spindle is of chrome-nickel, hardened and ground, and running in adjustable bearings. The grinding head has a reciprocating motion that can be adjusted from zero to 1/16 in., insuring smooth work when plunge cut grinding.

The feed, coarse or fine, is by hand and feeds as low as 0.0001 in. are obtainable. Quick movement is provided by means of a lever for use when plunge grinding. The wheel truing apparatus can be fixed quickly at any part of the swinging table. The drive is from a single pulley, by a motor mounted at the back and driving by belt, or by a flange motor. A pump for the coolant is driven from the main shaft and the water is drained into the body of the machine and filtered, all bearings being protected.

The master camshaft and the work revolve at the same rate, the movement of the swinging slide obtained from the master cam producing the desired form. Camshafts can be ground between centers or in a chuck. The maximum diameter of work taken is 4 in., and the maximum diameter ground with a new wheel is 2¾ in., the maximum number of cams being 16, and the maximum throw, ⅜ in. A 7½ hp. motor is required.

Weight, small machine, 5,200 lb., larger unit, 5,700 pounds.

— 38 —

Sharpening and Upsetting Machines, Drill

Demag A.G., Duisburg, Germany. [Vol.70,p.58E]

For the production of drills for mining purposes, two types, heavy and light, of drill sharpening and upsetting machines have been introduced by the above company. The former machine is intended for forging

and drawing-down as well as making, re-making, and re-setting drills of all kinds, drawing-down center drills, shaping hammer heads, etc., while the lighter unit will make single-, double- and Z-chisels, small drills, etc., besides re-making, re-setting and sharpening cutters. The heavy machine has a guide bed with an adjustable anvil piece together with jolting and sharpening hammers, both being supported in self-contained independent carriages. Interchangeable jolting and sharpening devices and forging and drawing-down hammers are also available.

In the lighter machine the forging hammer is omitted and often the jolting hammer is not needed, the sharpening hammer taking its place, but with reduction in output. All the hammers are driven by air at a pressure of about 100 lb. absolute, the consumption varying between 50 and 90 cu.ft. per min. at atmospheric pressure. For long drills the machine is supplied with a third pedestal block to support the bed.

— 39 —

Honing Machine for Scrapers

H. M. Ward & Co., Ltd., Birmingham, England. [Vol. 70,p.49E]

With this machine, scrapers can be standardized as to angle and radius. A circular hone is employed and the scraper itself is held on an angle block against

stops. The hone is mounted on a wheel head rotated by hand, the spindle being driven at 50 r.p.m. A cam gives this head an oscillating movement of 3/4 in. to the angle block, thus producing one cutting edge.

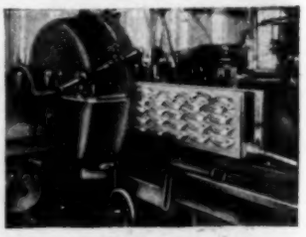
The other cutting edge is produced by reversing the scraper on the block. Raw edges are removed by a flat stone in a receptacle at the side. A felt pad soaked in kerosene bears on the face of the hone. The machine is available in both bench and pedestal types.

— 40 —

Chuck, Magnetic, Vertical-Face

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.70,p.9E]

The above company is agent for the Binder magnetic chuck, shown in the illustration on a Naxos Union horizontal grinding machine. On the table of this machine an angle plate is



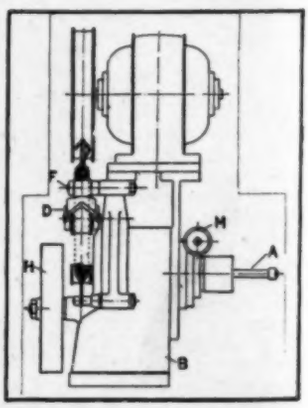
fixed and on this plate the chuck is mounted. The work pictured consists of steel casting jaws smooth-ground from the rough. The chuck is about 4x11¾ in. in size.

— 41 —

Grinding Attachment, Planetary

Fox & Offord, Alma St., Birmingham, England. [Vol.70, p.83E]

This grinding attachment has a planetary motion for grinding holes in work which cannot be rotated. It will also grind pins



externally, and fits on the lathe-bed or other suitable machine. The size of holes ground is from 1 to 2 in. in diam. The

grinding spindle normally supplied is for grinding to a depth of 3 inches.

The grinding spindle *A* has a planetary motion by means of eccentric sleeves carried in the body of the attachment. The casing *B* is fitted to a drum rotated for the purpose of adjusting the height of the center of the grinding spindle. A bracket on the drum carries the ¼-hp. motor and other gearing. The whole unit is rotated in the outer casing, the drum being clamped in the position to give the required center height

For driving the planetary motion of the grinding spindle a coupling-plate *H* is employed, attached to a drive-pin in the faceplate of the lathe. The coupling plate is keyed to the pinion shaft *J*, and drives a ring-gear fitted to the outer eccentric sleeve. An inner sleeve can be adjusted in relation to the outer sleeve in order to obtain the required diameter of throw. A small knurled knob controls the adjustment, thus providing the feed of the wheel as grinding proceeds and the hole diameter increases.

Lathes

— 42 —

Lathe, Motor-Driven, All-Geared, 9-Inch

C. Redman & Sons, Ltd., Halifax, England. [Vol.70,p. 58E]

The 4-hp. driving motor on this machine is mounted on a massive pedestal to avoid vibration at very high speeds, and the outer end of the motor shaft extension carrying the driving pinion is journalled in a standard ball bearing pedestal. By manipulating two levers, 40

threads, ranging from 3 to 45 per in., may be cut or 40 feeds obtained ranging from 1/12 to 1/184 in. per revolution. The machine can be quickly stopped and started by a friction clutch and brake.

The lathe admits work 4 ft. long between the centers. The crucible steel spindle is bored 2¼ in. and runs in adjustable, self-oiling bearings. The twelve spindle speeds range from 10.5 to 280 r.p.m. End thrust of the spindle is taken on a ball thrust bearing. The tailstock sets over for taper turning.

Weight, exclusive of motor, 2 tons.

— 43 —

Lathe, Center, Roughing 5-Foot

H. A. Waldrich, Siegen, Germany. [Vol.70,p.70E]

A roughing lathe, suitable also for finishing, available in seven standard sizes, with heights of centers from 19½ to 78¾ in., is made by the above firm. The length of bed is varied to suit. The 59-in. center machine will swing 94½ in. in diam. over the saddle and 118 in. clear of the bed, the spindle having 16 speeds ranging from 0.5 to 60 r.p.m. and carrying a faceplate 118 in. in diam. Operating devices are centralized on the carriage.

The inclosed headstock is driven by a motor with a three-to-one variable speed ratio for d.c., and speed variations by means of gears for an a.c. mo-

tor. Carriages are driven by feed-shaft or leadscrew, the latter unnecessary for high-speed roughing work. Comparatively short threads can be cut by means of a special top rest. Motion to the carriage is obtained from two racks. The machine can also be arranged with double carriages front and back. Each tool carriage itself swivels on a large base and can be provided with automatic feed to enable short cones to be turned. Eight feeds, both longitudinal and cross, are provided. When necessary each carriage has rapid adjustment. Stops are provided at each end of the bed. The back headstock can be moved along the bed by rack and gearing, or, if desired, by auxiliary motor. The loose headstock can be lifted off by loosening the bolts and, when the machine has two carriages, can be placed between them.

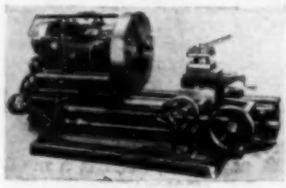
— 44 —

Lathe, Chucking, 32-Inch Swing

Stanley Machine Tool Co., Ltd., Halifax, England. [Vol. 70,p.333E]

This 32-in. lathe will take work 24 in. long in front of the chuck and swing 25 in. over the saddle. The bed is 7 ft. 9 in. long. The headstock provides 18 speeds from 6 to 270 r.p.m. All gears are of steel.

The spindle has a 3¼-in. hole



for bar work. Eight sliding and surfacing feeds from 8 to 64 cuts per in. are obtained from a box under the headstock. The sliding, surfacing, and screw-cutting motions are interlocked. The feeds are obtained from a drop worm.

Floor space 8 ft. 6 in. by 3 ft. 9 in.; weight 3 tons.

— 45 —

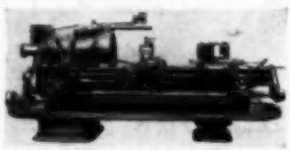
Lathes, Turret, 8-Inch, No. 7

Alfred Herbert, Ltd., Coventry, England. [Vol.69,p.263E]

This machine is designed primarily for chuck work, but is also suitable for bar work. The height of centers is 8 in., the maximum swing over the bed, 16¼ in., and over the cross-slide, 8¾ in., the maximum distance from the flange of the spindle to the base of the turret being 51 in. Drive is by a single pulley head, eight reversible speeds from 18 to 366 r.p.m. being obtained.

The saddle carries the firm's chasing arrangement, a length of 15 in. being cut with the standard leaders. With the standard set of 7 leaders and nuts, 21 threads can be cut, and extra leaders for special pitches are also available. Left-hand threads may also be cut.

The apron saddle has six interlocked, automatic longitudinal and cross feeds ranging from 21 to 146 cuts per in. A taper attachment for internal and external threads is also available. There is square turret on the



front of the cross-slide and additional tools such as forming and cutting-off tools are in the back toolpost.

The turret can be indexed by hand quickly to any position either backwards or forwards, and the turret slide has quick power motion in either direction. The apron provides twelve reversible feeds ranging from 12.5 to 262 cuts per in. An overhead support is provided for knee turning tools and combination turning and facing tools.

The lathe is adapted for driving with a 15-hp. constant-speed headstock motor through a laminated belt or noiseless chain. Floor space occupied is 11 ft. 6 in. by 4 ft. 10 in.; weight with standard equipment, 5,300 pounds.

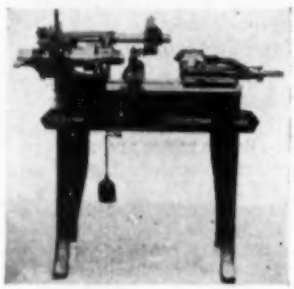
— 46 —

Lathe, Capstan, 4½-Inch

Selson Engineering Co., Ltd., Hatton Garden, E.C., London, Eng. [Vol.70,p.69E]

The above company is agent for the 4½-in. capstan lathe made by Auerbach & Company, Dresden, by arrangement with Gebr. Heinemann, A.G., St. Georgen, Schwarzwald, Germany. The machine is suitable for the manufacture of metal fittings, screws, etc., and for general engineering and light machining.

The height of centers is 4½ in., the spindle being bored 1¼ in. to admit a 1-in. bar through the lever chucking device, or 1¼ in. with an automatic chucking



head, the length of the bed being 35 in. The turret is revolved and locks by the movement of a lever. The machine may be fitted with a lever collet clutch or with self-centering chucking head. The drive is by a two-step cone pulley, standard spindle speeds being 1,100 and 2,500 r.p.m. Maximum swing with chasing device is 8 in., and over the cross-slide 4 in. in diam. The cross-slide has front and rear toolposts. The turret carries six tools and has automatic revolving length stops, the maximum distance between the spindle nose and turret being 10⅜ in. With countershaft, net weight, 585 pounds.

— 47 —

Lathe, Turret, with Flange-Motor Drive

Selson Engineering Co., Ltd., Hatton Garden, E.C., England. [Vol.70,p.97E]

This Max Hasse & Co. turret lathe has 6¼ in. height of centers and is made in an improved form, the chief change being, however, in the use of a 2-hp. flange motor. The main dimensions are as for the cone-pulley model. The headstock is entirely inclosed, the gears running in an oil bath. The driving motor is placed at the back and is separate from the gearbox. The latter provides two speeds and the headstock two also, ranging from 185 to 1,500 rev. per minute.

A pedal controls the headstock speed, and all speeds can be reversed. The maximum distance between the spindle nose and the turret head is 13¾ in.,

the spindle being bored 2 in. The turret has eight holes, each $\frac{7}{8}$ in. in diam. In addition to the cross stops, each tool has a special automatic longitudinal stop. A taper-turning attachment is provided and screw cutting can be undertaken.

— 48 —

Lathe, Turret, Flange-Motor Drive

Fittler Co., Leipzig, Germany. [Vol.70,p.105E]

This 7½-in. center turret lathe has a flange motor and all-geared head in place of the friction backgear drive. The turret is of new design. The plate carrying the tools can be taken off readily and replaced with another set-up for a different job. The spindle will admit bars 1⅜ in. in diam. The axis of the turret is horizontal and is low so that the top toolhole is in front of the spindle. Facing can be done by revolving the turret around its own axis. The turret

is 10½ in. in diam., and has 16 toolholes, the longitudinal feed being by hand or automatically at eight reversible rates controlled by lever. The stop drum carries 16 stops for the length feed, having fine adjustment, with an open scale graduated to 0.1 mm. A safety coupling stops the longitudinal feed in case of overload.

The spindle will take faceplates 11¾ in. in diam. The greatest swing over the bed with the chasing arm, when fitted, is 12$\frac{3}{16}$ in., or without this arm 17$\frac{5}{16}$ in. in diam. The maximum distance from the collet bar chuck to turret is 18¼ in. The motor used is an a.c. reversible type, giving, with the gearing, 16 spindle speeds in each direction.

— 49 —

Lathe, Turret, Hexagon, Universal

A. C. Wickman, Ltd., Coventry, England. [Vol.70,p.146E]

Gebr. Heinemann A.G., St. Georgen, Germany, builds this turret lathe with standard automatic chuck which will take black or bright bars up to 1$\frac{31}{64}$ in. in diam. or, with special automatic chuck which will turn short lengths up to 3$\frac{25}{32}$ in. in diam. The machine is similar to lathes described in the European issue for March 31, 1928, page 95E, but has a number of improvements. The height of centers is 6¾ in., the maximum swing over cross-slide guides is 15¾ in., and 12$\frac{9}{16}$ in. without the use of the rear toolpost or 9$\frac{7}{16}$ in. with this toolpost. The maximum distance between the chuck and the turret is 28¾ in. and the maximum boring length is 7¾ inches.

The headstock gives ten reversible speeds from 40 to 500 r.p.m., or 56 to 600 r.p.m. The cross and turret slides have eight reversible feeds. The headstock is driven through single pulley, sliding gears, disk couplings and clutches. The shafts run on ball bearings. The main spindle is bored 2$\frac{1}{16}$ in. The thrust is taken by ball bearings and a central lubricating system with force feed is supplied. The machine may also

be driven by a 5-hp., variable-speed motor. The cross-slide allows full swing for the work and even on chuck work either toolholder at the front or rear can be used. The toolholders can be adjusted toward each other. Screw-cutting attachments can be fitted to the cross-slide, while a chasing attachment for internal and external threads can also be used. The cross-slide can be fitted with taper- and spherical-turning devices.

The turret is mounted centrally on its slide, the half facing the headstock passing under the cross-slides that the two can be worked close together. Safety stops prevent accidents due to the slides meeting, the feed being tripped automatically. Without the automatic chuck the machine weighs about 3,090 pounds.

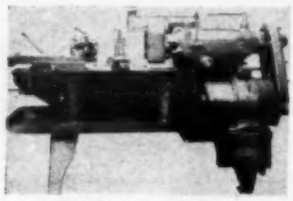
— 50 —

Lathe, Capstan, with Self-Contained Motor Drive, No. 4

Alfred Herbert, Ltd., Coventry, England. [Vol.70,p.172E]

The firm's No. 4 capstan lathe has been fitted with self-contained motor drive. A standard constant-speed motor is used, both motor and control gear being accessible. Drive is by a noiseless chain running in an oil bath. The floor space occupied does not exceed that required by the standard belt-driven machine.

The machine, motor and switch-gear form one unit, which may be lifted by a crane. The chain sprockets, chain, and pump belt are entirely covered by cast-iron guards. The design will accommodate standard 3-hp.



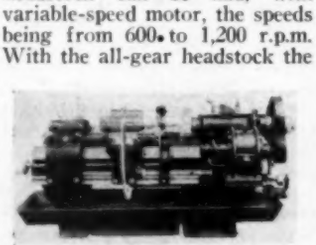
d.c. or a.c. motors. The machine has 6½-in. centers, and the spindle will admit 2-in. bars and has eight speeds in either direction. The swing over the cross-slide is 6¼ in., and the working stroke of the capstan is 9 in. with four automatic feeds.

— 51 —

Lathe, Multi-Tool, Semi-Automatic

A. C. Wickman, Ltd., Coventry, England. [Vol.70,p.81E]

This company is the British agent for semi-automatic multi-tool lathes in the 8-in. center size made by Gebr. Heinemann, A. G., St. Georgen, Germany. The machine is made with beds in five standard lengths, which take as a maximum from 15¾ to 53 in. between centers. The largest diameter admitted over the cross-slide of the turning carriage is 12½ in. and over the surfacing carriage 11⅓ in. The speed range is from 28 to 250 r.p.m., or 22 to 195 r.p.m., but for small work a head is available with gears arranged to give between 88 and 500 r.p.m. For turning aluminum, a cone-pulley headstock can be had, with variable-speed motor, the speeds being from 600 to 1,200 r.p.m. With the all-gear headstock the



drive is by friction pulley, with brake for bringing the spindle quickly to rest. The spindle is bored 2⅜ in. and can be used for chuck work, and for camshafts and similar slender shafts with the free end placed in the bore.

Both parallel and taper turning can be done simultaneously by the use of a traveling taper-turning attachment. The toolrest can be swiveled through 90 deg. so that it can also be used for sliding. Toolholders are available in a number of standard types and are interchangeable on the front and back carriages, and a profiling device can also be applied. Change gears give 32 feeds. Shafts and bearings are oiled from a central reservoir. For electric drive, the motor is mounted on a bracket at the back and the machine takes from 6 to 15 hp., according to the work being done. Where compressed air is available, the use of air chucks is recommended.

— 52 —

Lathe, Car Wheel, Redesigned

Alfred Herbert, Ltd., Coventry, England. [Vol.69,p.316E]

The feature of the re-design of the car wheel lathes made by Noble & Lund, Ltd., Felling-on-Tyne, England, is the provision for driving from the main motor direct to each of the heads. Control has likewise been centralized. The main drive is by a 50-hp. motor through a gearbox arranged for two or six speeds.

Lathes are built in 37-, 48-, 66-, 78-, and 90-in. sizes. In the 66-in. size the minimum diameter of the wheel accommodated is 30 in., the maximum gage 5 ft. 6 in., minimum gage 4 ft. 8½ in., but a metric gage can be arranged. Maximum length of axle admitted is 9 ft.

The bed is approximately 22 ft. 9 in. long, and the headstock is bolted and keyed to it. The tailstock has power traverse by a 7½ hp. reversible motor. The main spindles are of cast iron, and carry internal steel spindles, the front ends of which are taper bored to carry outside

journals of axles by means of split taper bushings. Lathe centers can be provided for the internal spindles if required for locomotive wheels. The faceplates are 68 in. in diam. T-grooves are provided for fixing driving dogs, and, in the 66-in., and larger lathes, recesses allow for the reception of crankpins.

Two toolrests are fitted at the front of the lathe and quick-acting tool clamps are employed. Pneumatic clamping can also be arranged. The top toolslide is swiveled to an angle of 1 in 20 to suit the wheel treads and has feed motion for roughing the tread and flange. The intermediate slide can move parallel with the faceplate for the purpose of feeding to depth of cut and for forming. The feed motion is of intermittent type, in four rates ranging from ¼ in. to ½ inch. Back toolrests may also be fitted to enable the sides of the tires to be turned while the tread and flange are turned.

Overall dimensions, 25 ft. 3 in. by 13 ft. 6 in.; weight 37 tons, exclusive of the electrical equipment.

— 53 —

Lathe, Crankshaft, Semi-Automatic

E. H. Jones (Machine Tools), Ltd., London, N., England. [Vol70,p.77E]

The above firm is British agent for crankshaft lathes made by Gebr. Boehringer, G.m.b.H., Göppingen, Germany. The lathes are made in two sizes, 15¾ in. and 17¾ in. height of centers, and in different

types, including those with back centers of ordinary form and other machines with positive drive for the crankshaft at both ends, and with either one or two carriages. The cutting speed is kept constant.

The feed is set for roughing, and automatically changes to a quarter the rate for finishing purposes. When the required diameter is reached the feed is disengaged. The saddle is fitted with rapid traverse. In the machine shown, d.c. motor drive is used, giving 41 speeds. The spindle speed range is from 14 to 121 r.p.m., and eight feeds are provided. The lathe is controlled by push buttons, which give forward, reverse and stop motions, and an emergency button will stop the machine instantly.

— 54 —

Lathe, Threading, Automatic

A. H. Schütte, Cologne, Germany. [Vol.70,p.79E]

This automatic threading lathe cuts square, V and Acme threads and special forms, also single and multiple, internal or external right- or left-hand, and in pitches of English, metric or module. The spindle nose will take a driving or dividing plate for driving the work.

Two independent, adjustable toolslides are provided, the cross-feed being effected by disk cams, with automatic feed-trip to disengage the tools. In addition to the usual steady rests, an automatic steady rest is available which opens when the

tools are approaching and closes again when the tools have passed. The height of centers is 8⅝ in. and the maximum swing over the main slide is 7⅞ in., or over the bed 18¾ in. The machine is built in bed lengths to give from 19¼ to 19 ft. 8 in. between centers. The hole in the spindle is 1 5/16 in. in diam. There are 13 spindle speeds.

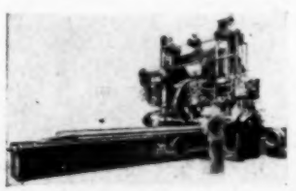
Milling Machines

— 55 —

Milling Machine, Planer-Type, Universal, Four-Spindle

Kendall & Gent, Ltd., Manchester, England. [Vol.69,p. 304E]

The advantages claimed for this machine include: A large number of operations possible, high cutting speeds, and simplicity of control. The table traverse is 16 ft., the width milled, 4 ft., the height under face cutters, 4 ft., and the minimum diameter of spindles, 3½ in. The vertical spindles mounted on the cross-slide have independent adjustment by hand and power. The horizontal spindles mounted on the uprights can be operated independently or simultaneously and may be used for slab milling, the mandrels carrying the cutters being driven from each end and supported in the center. Quick hand and power traverse to the table is also provided to assist in setting the work, and an automatic stop trips the self-acting feed at any desired point.



The cross-slide carrying the vertical saddles is adjusted vertically by power. These saddles have hand and variable self-acting feed motions in each direction, together with quick traverse. The horizontal saddles on the uprights are counterbalanced, and are also provided with hand and variable self-acting vertical feed motions, together with quick traverse. The spindles are adjustable. The drive is by variable-speed motor through gearing, and a variable-speed motor and a two-speed change box mounted in the right-hand upright provide a wide range of feeds to each spindle. All starting mechanisms are controlled by a push-button system at the front of the machine. This makes it convenient for the operator and is also a safeguard in emergencies.

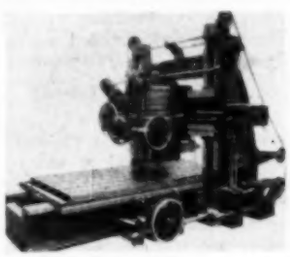
— 56 —

Milling Machines, Planer-Type

Hulse & Co., Ltd., Salford, Manchester, England. [Vol.70, p.57E]

Of the two planer-type milling machines introduced, the smaller has a width between uprights of 2 ft. 9 in., and a length of table traverse of 7 ft., while in the larger machine the width between uprights is 5 ft. 8 in., and the table traverse 10 ft. The spindle of the smaller machine has a self-acting down feed suitable for drilling, trepanning, and facing. The larger machine has a milling head with self-contained rotary motion by means of which circles and arcs of circles of varying radii may be milled without moving the work. This machine is adapted to the milling of radii at the corners of rectangles. Both machines can be arranged for profiling. Drive is by constant-speed motors.

On the 4-in. spindle machine,



the distance from the spindle nose to the top of the table is 18 in. The vertical traverse is 6 in., and the eight spindle speeds range from 15 to 150 r.p.m., and the four table feeds are 1, 2, 3 and 4 in. per min. The spindle nose is bored in standard taper.

The machine with 4½-in. spindle will mill work 10 ft. in length by 5 ft. 8 in. between the uprights and the maximum distance from the spindle nose to the table is 3 ft., and the minimum 1 ft. The vertical adjustment is 6 in. by hand. The 18 spindle speeds range from 10 to 150 r.p.m., and the nine feeds from 1 to 8 in. per minute.

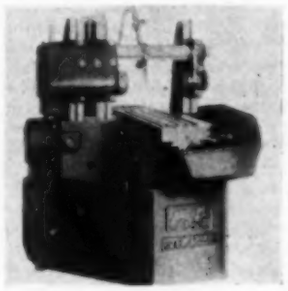
— 57 —

Milling Machine, Horizontal

L. Loewe & Co., Berlin, Germany. [Vol.70,p.72E]

Surface millers are built in two types, one with a single spindle of Lincoln type, and the other with two horizontal spindles opposed, each carried on a standard so that no overarm is provided. In each type, one lever starts the cutter and gives the table feed motion and automatic advance. In the two-spindle machines, reversing mechanism is provided independently for the spindles. A brake is available for instantaneous stopping.

Each spindle has 16 speeds, from 30 to 355 r.p.m. and the 12 feeds are from 1 1/64 to 18¼ in. per min. A safety clutch on the feed mechanism prevents breakage due to overload. The table returns automatically at the



completion of the cut while the cut is automatically stopped. The table movement can be operated by hand by means of a lever. The machine can thus be used either as a semi-automatic or a full-automatic for milling. Drive is by a single pulley, or a built-in motor, with a friction clutch for each spindle. Lubrication is through centralized oil reservoirs.

— 58 —

Milling Machine, Vertical, High-Speed

Muller & Montag, Leipzig, Germany. [Vol.70,p.80E]

The vertical milling machines include a special high-speed machine with low circular rotary table, either hand or power-actuated. This machine is made in six standard sizes, the one shown having a table, 4 ft. in diam. It is designed for manufacturing parts of aluminum and similar material, clamped on the table by special universal devices. Periphery speeds of the cutter up to 5,700 ft. per min. are obtained. The cutter body is of special form, made of aluminum for lightness, and four knife-type, high-speed-steel

cutters are employed per head.

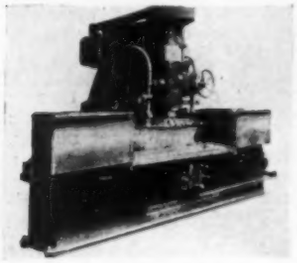
The same company also makes a combined vertical and horizontal miller for cam work, and for flat work, a similar machine, but with vertical spindles only. A vise on the same stand prevents the job from being lifted.

— 59 —

Milling Machine, Vertical, High-Speed, for Aluminum and Light Alloys

Alfred Herbert, Ltd., Coventry, England. [Vol.70,p.117E]

The Lumsden Machine Tool Co., Ltd., Gateshead, is the manufacturer of this machine for milling plane surfaces on aluminum and similar soft metals and alloys at high speeds. The machine is a typical vertical type, but is modified so as to use inserted-tooth cutters. The drive to the cutter spindle is from a 15-hp. motor. The table drive is from a 2-hp. motor through a reversing box to the table screw. The cutter is 21 in. in diam., the normal speed



being 2,000 ft. per min., and the speed of the table traverse is 24 in. The cutter is bolted to a forged flange on the spindle, which runs in ball and roller bearings.

The cutter head is fixed to the column, the vertical adjustment of the cutter being obtained by the movement of the spindle ram. The cutter has a large number of triangular-shaped teeth so placed in the body that natural rake is given to the cutting edges. Clearance is ground on the bottoms of the teeth by means of a small portable electric grinder. Guards are fitted all round the table to prevent the chips from flying. A pump supplies cutting lubricant.

Table surface is 20x72 in., which is the milling capacity. Maximum height from table to cutter, 15 in., minimum height, 4 in. Floor space, 8 ft.x18 ft. Net weight, without electrical equipment, 7½ tons.

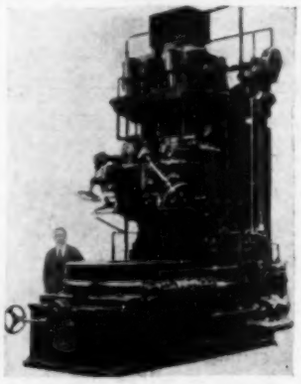
— 60 —

Milling Machine, Vertical, Continuous, Two-Spindle, Table-Type

W. Asquith, Ltd., Halifax, England. [Vol.70,p.129E]

This machine has been developed for machining automobile cylinder blocks. Two continuously-rotating milling cutters—one roughing and one finishing—operate on pieces mounted in fixtures on a continuously-rotating worktable combine two operations.

The machine will take pieces and fixtures of a combined



height up to 20 in., and the cutter spindles have a downward adjustment of 10 in. Cutters up to 24 in. in diam. may be used and cylinder blocks of any normal length may be machined. Cutter spindles are mounted on separate slides, so that variations in cut on the roughing spindle do not affect the finishing spindle. Pieces of entirely different design may be milled at the same time on the same table. Drive is by a 30-hp. motor mounted at the top of the column.

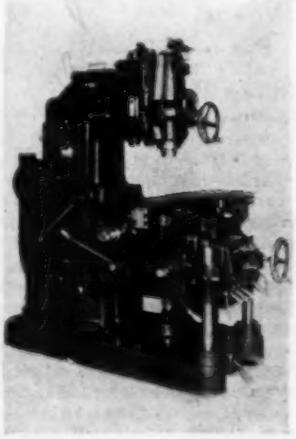
The table is mounted on a slide allowing for adjustment of the table axis to the axis of the cutters. The minimum distance is 11¼ in. The table is driven from the motor shaft through gears, shafting, and a worm-wheel, and the speed can be changed. A hand-lever controls the reverse motion of the table. Lubrication of the machine is automatic. Floor space occupied is 10 ft. 8 in. x 8 ft. Total height, 13 ft. Approximate weight, 24½ tons net.

— 61 —

Milling Machine, Vertical, with Twin-Pillar Knee Support

Biernatzki & Co., Chemnitz, Germany. [Vol.70,p.147E]

This improved vertical milling machine has a table with a working surface of 72¾x16¾ in., and is provided with 18 feeds in each direction, as well as rapid



power traverses. The distance from the column to the center of the spindle is 18¾ in.; minimum and maximum distances between the spindle and the table, 2 and 21¾ in., respectively; vertical feed, 4 in. A feature of the machine is the use of twin-pillar supports on the baseplate for the knee bracket. The drive may be by single pulley with friction clutch, by overhead belt, by motor inclosed in the column, or by flange motor. Starting and stopping can be controlled by hand levers on each side of the machine and also by pedals at the front.

All shafts running at high speeds are carried in roller bearings. The milling spindle runs in adjustable bearings of special steel-alloyed brass. The sixteen spindle speeds, 14 to 450 r.p.m., are in geometric progression, controlled by two levers, and change of speed can be effected while the machine is running. The main drive is by sliding gears, hardened and ground. A central oiling system provides for lubrication of the bearings and also the gears. This feature is in line with modern practice and insures continuous operation.

— 62 —

Centers, Swivel, for Milling Machines

J. Ackworthie, Ltd., Birmingham, England. [Vol.70,p.33E]

This device for direct indexing is made with fixed head and back center, or with heads to swivel and back center to move above or below center. The swivel head will move half-way around to 10 deg. below the horizontal each way, and can be used at either end of the machine table. It has a removable plate with three rows of holes, 72, 30, and 28, that will divide

from 2 to 72 by various steps. The spindle has a ⅝-in. hole through it, and the front is bored No. 3 taper. It has also a screw thread to take a chuck. The driving plate screws on to the spindle. The centers are 4⅜ in. high.

Planers and Shapers

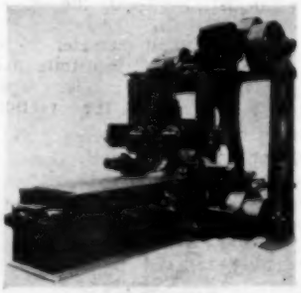
— 63 —

Planing Machine, High-Production

C. Redman & Sons, Ltd., Halifax, England. [Vol.70,p.107E]

These high-production planing machines are suitable for work 3 ft. wide by 3 ft. high by 8 ft. long. The driving mechanism is a separate unit. Any shaft with its gear wheels can be removed without disturbing the bed.

Tool boxes swivel through a



complete circle and a sensitive power elevating mechanism for the cross-slide and toolholders, operated by cone clutches and spur gears, has been incorporated. The bed is 13 ft. long by 24 in. deep, the width between housings being 3 ft. 2 in., and the maximum height under the cross-slide, 3 ft., the worktable being 32 in. wide. The cross-slide face is 12½ in. deep to insure rigidity by eliminating vibration, thus permitting heavy cuts at high table speeds.

There are four toolholders, two on the cross-slide and one on each housing. The down feed to the tool boxes is 12½ in. long and can be varied from zero to ½ in. The cutting speeds provided are 30, 40 and 50 ft. per min., with return at 120 ft. per minute.

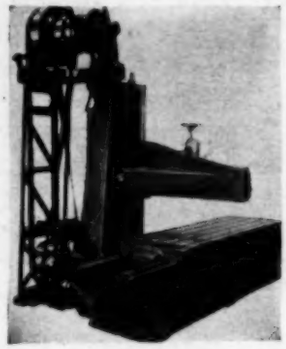
Horsepower required, 12; floor space occupied, 19 ft. by 8 ft. 8 in. wide; total height, 8 ft. 10 in.; approximate net weight of the planing machine, 6½ tons.

— 64 —

Planing Machine, Open-Side

Summerskill Bros., Sowerby Bridge, England. [Vol.70,p.118E]

This openside planer will take work up to 6 ft. long by 2 ft. 6 in. wide by 2 ft. 6 in. high. The bed is 10 ft. 4 in. long, the center-to-center distance between the V-guides being 18 in. The working surface of the table is 6 ft. x 2 ft. 2 in. wide, while the overall length, including chip pockets, is 7 ft. The vertical down feed to the toolbox is 8½ in., either by hand or self-acting, and the toolbox can be swiveled on either side of the vertical. Both hand and automatic traverse are along the cross-slide, also provided to the toolbox. All control levers are



placed within easy reach of the operator.

The drive is transmitted to the table by gearing in the usual way. The machine gives one cutting speed only of 40 ft. per min., with a quick return of 100 ft. per min. The knock-off mechanism is controlled by dogs at the side of the table. A side toolbox may be embodied, the side tool being then driven by an independent feed disk, so that the cross-slide toolbox may be used for roughing, while the side box is engaged on fine feeds.

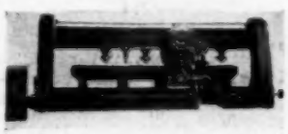
Weight 4 tons.

— 65 —

Planer, Plate-Edge, Rack-Driven

Scott Bros. (Halifax), Ltd., Halifax, England. [Vol.70,p. 158E]

This direct motor- and rack-driven, plate-edge planing machine has a maximum stroke of 10 ft., but the manufacturer can supply the machine up to 40 ft. stroke. The housings carrying the top beam have a slight gap to allow plates of unlimited length to be planed at more than one setting. The bed is 23 in. wide across the flats. The worktable is 24 in. wide and is sup-



ported upon five box-section standards. The steel driving rack is bolted to the table in two sections. A self-contained 16-hp. squirrel-cage motor is mounted on a saddle and drives through a gear case.

A rod in front of the machine with adjustable collars is actuated by the saddle in both directions, operating the automatic reversing control. A master switch starts and stops the machine by hand from the saddle platform. The cutting tool is of the double-edge type, cutting in both directions at 32 ft. per min. The canting toolholder operates automatically. The tool is fed in and adjusted vertically by hand, and can be tilted for machining the beveled edges of plates. Hydraulic and hand clamping jacks are fitted.

Overall length 17 ft. 6 in. Total weight, including the electrical equipment, 17,300 pounds.

— 66 —

Shaping Machine, Five-Head

Whitaker & Clapham, Keighley, England. [Vol.70,p.108E]

For shaping loom ends, the machine has two box-section side beds, each 3 ft. 6 in. long by 15½ in. wide across the guides, together with another bed of similar size at the rear. All beds are secured together by the worktable, which is 4 ft. 3 in. wide by 3 ft. 6 in. long.

To the top of each bed is fitted a saddle, 2 ft. 10 in. long by 19 in. wide, having two T-slots provided in the top the full length, to which are bolted two heads with overhanging slides. The front head on each saddle has two toolholders, the back head on each saddle having one toolholder only. The back bed has one head with overhanging slides, carrying two toolholders. All heads are movable and interchangeable and all three saddles have a variable stroke ranging up to 8 inches.

The drive is from a three-speed cone pulley through gearing, the saddles being driven either separately or simultaneously by the use of friction clutches. The toolholders have self-acting outward traverses by wheel and screw, also self-acting adjustable stop motion by means of rods, hoops, and clutches. Each toolholder has

one adjustable stop, so that, when the tool has been lowered to the depth required, the stop can be set and the tool raised for taking off the loom end when machined and then set down against the stop ready for the next frame.

Presses

— 67 —

Press, Notching, High-Speed

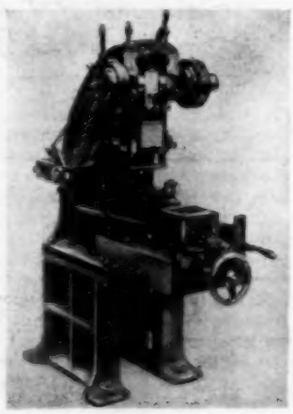
Taylor & Challen, Ltd., Birmingham, England. [Vol. 70,p.20E]

High-speed notching presses, having a range from 400 to 620 notches per min., are available. The drive is by a light flange pulley. The machine employs a key clutch and a quick-acting brake, automatically released when the notching takes place. The stroke is ¾ in., the amount of adjustment 1½ in., the largest diameter of disk notched, 17 in., and the smallest diameter, 3½ in. A friction band transmits motion from the horizontal crankshaft direct to the vertical spindle.

The dividing ring is 8½ in. in diam., is removable for different numbers of notches, and operates in conjunction with the friction feed. Slight excess rotation is given to the dividing ring and on the return motion a spring-controlled stop accurately locates the position of notching.

The pallet carrying the plate is adjustable for various types of dies and for the grinding-down of dies. The bed is adjustable from back to front for various diameters of armature plates.

The machine is 60 in. high, 50 in. long, and 27 in. wide. Weight 1,700 lb. net.



— 68 —

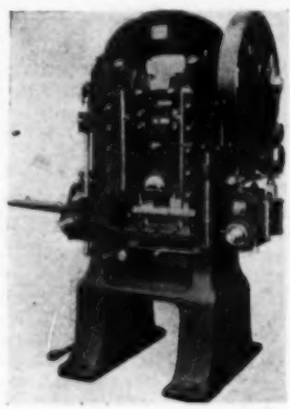
Presses, Punch and Drawing

Hunton, Ltd., Fitzroy Court, London, W., England. [Vol. 70,p.78E]

Automobile punch presses and double-side drawing presses, manufactured by Maschinenfabrik-Weingarten, Weingarten, Germany, are handled by the above British agent. The former are suitable for clock manufacturing, making stator and rotor blanks from strips, and similar work. Features of these units include the balancing of the ram, and a special device for feeding the strips. Precision roller feed is available, with a reel for unwinding, and waste shears for clipping the used strips. The machine is arranged for motor drive, the number of strokes being up to 250 per minute.

The company also produces a single-ended eccentric press with an adjustment for the ram, allowing the travel to be regulated to suit the height of the tools while the machine is in motion. Safety devices prevent unintentional strokes and unintentional engagement while changing tools. The machine has an automatic pawl feed, with reels for winding and unwinding, and an automatic recorder for the number of strokes. It is arranged for motor drive, the speed being about 140 strokes per minute.

The heavy, double-sided, punching-and-drawing crank press has four steel rods shrunk in the columns. Large distance between the table and ram and long stroke have been provided.



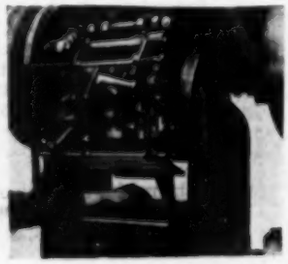
A patented adjustment of the ram by a reversing motor is provided to suit each height of tool or thickness of material. A pneumatic attachment avoids wrinkling of the piece and ejects it. Lubrication is automatic. The capacity is 500 tons.

— 69 —

Guard, Pull-Out, on Double-Action Press

J. P. Udal, Upper Dean St., Birmingham, England. [Vol. 70,p.84E]

The guard is driven from the outer slide, which is cam- or toggle-actuated, and descends quickly when the main crankshaft begins to revolve. In the device pictured, the guard is driven from a small bracket mounted on a boss on the outer slide of the press. This bracket is independent of the slide.



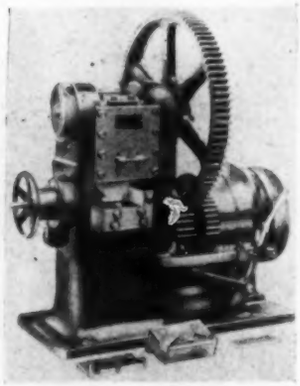
Shearing Machines

— 70 —

Shear, Angle, Bevel

Carter & Wright, Halifax, England. [Vol.69,p.306E]

In addition to the cropping of the usual angle and channel sections, this machine will shear special shapes or rolled steel shoes. The steel eccentric shaft is driven by tight and loose pulleys at 300 r.p.m., through double-reduction spur gearing. The pulley shaft runs in phosphor-bronze bushings and a flywheel balances the effect of the shearing stroke. The ram has a stroke of 3 in. and there are 20 strokes per min. The handle



at the front of the ram slide enables the motion to be disengaged without stopping the machine.

Both hand and foot lever control are fitted. The handwheel on the left-hand side operates a slide which determines the width of opening for accommodating the section to be cropped. The shear blades and bottom block are interchangeable with the special blades and block employed when dealing with the rolled steel shoes.

Weight, 4,500 pounds.

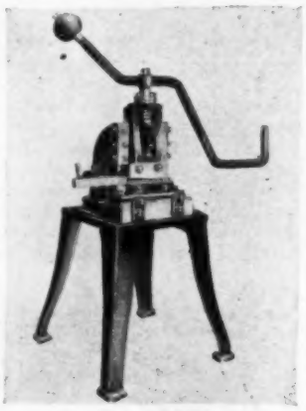
— 71 —

Shears, Fly Press Type

Soag Machine Tools, Ltd., Horseferry Road, London, S.W., England. [Vol.70,p.129E]

This fly press shear has a screw-operated ram, working in V slides, its lower end taking the shearing tool or acting as a ram for press work. A stop is available for cutting to width. Behind the shear blades, another stop can be set independently for length. A third stop immediately in front of the shear blades enables the work to be set for cutting to any angle. With this stop the shear blade may be used for notching to sharp angles, the blade being specially shaped for this purpose.

The table has a large slotted surface with a hole through it.



The machine is intended for bench use or can be mounted on legs. It is built in three sizes with shear blades 7½, 9, and 9⅞ in. and net weights are 670, 960 and 1,230 lb., respectively.

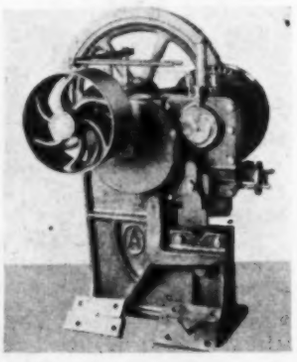
— 72 —

Shears, for Bar-Iron, All-Steel

S. Appleyard & Co., Boothtown, Halifax, England. [Vol. 70,p.159E]

Siemens-Martin steel is used throughout in this bar-iron shear, including the machine-cut gears, with the exception of the flywheel and driving pulleys which are of cast iron. The machine will cut squares up to 1½ in., rounds up to 1⅞ in., angle iron with special blades up to 3½ by 3½ in., and flats 6x1 in. The main frame is a webbed steel casting having a gap for taking the bars to be sheared. The cutting slide has an automatic disengaging motion so that it is impossible to take a false cut, and it always stops at the top after the stroke.

If required the machine can



be used for continuous cutting. The machine then makes 24 strokes per min. The cast-steel tempered blades are 10 in. long. An adjustable guide holds the bar in position and prevents tilting during the shearing operation.

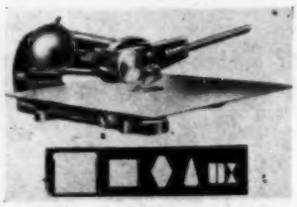
Floor space: 4 ft. 7 in. by 3 ft. 7 in.; height, 5 ft. 6 in.; weight, 2,500 pounds.

— 73 —

Shears, Hand-Operated, Interior

F. G. Edwards, Ltd., 406 Euston Road, London, N.W., England. [Vol.70,p.8E]

An interior shearing machine has been added to the line of sheet-metal working equipment made by the above company. It is intended for such work as automobile bodies, stove fronts, etc. It cuts straight- and curve-sided figures in steel sheets without any previous drilling, nicking, or other operation. The lower blade is fixed and has a straight edge, while the upper blade is curved and pointed, and is operated by a hand lever. The cut is started by driving the point of the upper blade through the material, after which the shape is determined by moving



the work. Steel sheets up to No. 14 gage can be cut, and cuts can be started 27½ in. from the edge of the material.

The steel worktable is 31½ in. square. Both blades are tool steel, and are removable for grinding. Stops are provided to limit the upward and downward movement of the lever. The length of cut may be varied from a sharp pointed incision to the maximum length of 3 in. The bench type machine weighs 224 lb. and can be mounted on legs, when required.

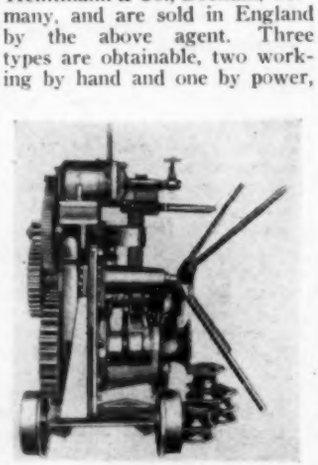
Other Machines

— 74 —

Bending Machines, Rail and Pipe

J. E. Burnell, Llanelly, England. [Vol.69,p.249E]

These machines are manufactured by Bochumer Eisenhütte Heintmann & Co., Bochum, Germany, and are sold in England by the above agent. Three types are obtainable, two working by hand and one by power,



and the special feature is that the bending rollers revolve while the rail or pipe is drawn across. The rollers are driven by gearing and in the case of the smallest machine, can be actuated by hand. The machine will bend rails or sections weighing 12 lb. per ft. to a minimum radius of 3 ft. 8 in. In this case, the rail is set horizontally, but rails up to 20 lb. per yd. can be bent vertically and 2-in. pipe to a minimum radius of 3 ft. 2 in., both being cold.

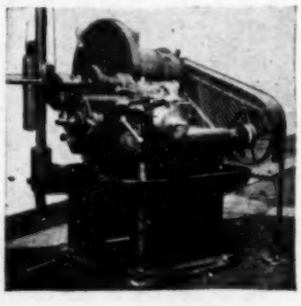
The second hand-driven machine requires two operators and will bend rails and sections up to 67 lb. per yd., the minimum radius being 5 ft. 1 in. Rails can also be bent vertically up to 36 lb. per yd., and pipes up to 4 in. in diam. The third type is driven by a compressed air motor, but an electric motor can be used. It will deal with rails up to the same limit as in the larger hand-driven machine, and up to 5 in. pipe. Rails in the course of bending move at the rate of 60 to 75 ft. per min. and are bent or straightened after passing across three times. The pressure is applied by means of a center roller carried in the frame and screw-controlled by a handwheel or ratchet lever conveniently placed.

— 75 —

Cutting-Off Machine, Roller

Selson Engineering Co., Ltd., London, E.C., England. [Vol. 70,p.105E]

Mars-Werke, A.G., Nürnberg-Doos, Germany, is the manufacturer of this roller cutting-off machine for which the above company is British agent. Rollers are machined from rods, the main cutting being done by a friction saw. Besides cutting the rod, the machine chamfers the ends of the piece. On the base of the machine a 4-hp. mo-



tor is mounted driving a 20-in. disk at 2,800 to 3,500 r.p.m. The disk is knurled at the edge. The blade is approximately $\frac{3}{16}$ in. thick, reduced to $\frac{1}{16}$ in. at the cutting edge.

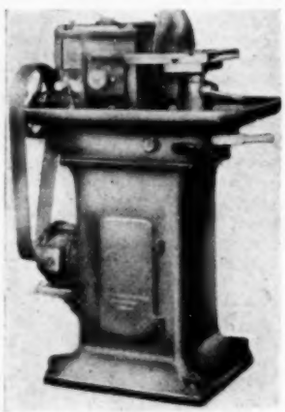
The rod passes through a collet chuck and is rotated as each roller is cut off. By means of cams, the rod is fed forward against the disk by the small amount necessary and cutting takes place. Another toolslide, also operated by cams, chamfers the two corners. Rollers $\frac{1}{4}$ in. diam. by $\frac{1}{2}$ in. long have been cut to an accuracy of 0.002 in. The machine will run approximately 5 hours without changing the blade. Weight 1,100 pounds.

— 76 —

Filing Machine, Rotary

J. Zehnder & Sons, Granichen, Switzerland. [Vol.70,p.172E]

This machine is built in two forms, one of which is driven by belt providing two speeds to the spindle, while the other is driven by a 1-hp. motor and gearbox of Norton type, the latter providing six speeds ranging from 60 to 300 r.p.m. The machine employs circular files which may be either of the disk, ring, or short cylindrical form. The disks are from $5\frac{1}{2}$ to $11\frac{3}{4}$ in. in diam. For the ring type



a conical collar is formed solid at the front of the spindle of the machine and a stout aluminum bushing, split and tapered to suit, is placed inside the ring, a key insuring location.

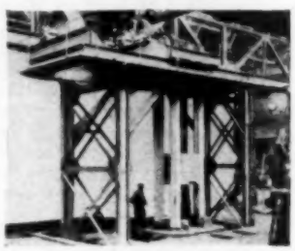
The spindle is hardened and ground, and the bearings are of bronze with adjustment for wear and with wick lubrication. The worktable is also hardened and ground and measures $9\frac{7}{8}$x$9\frac{7}{8}$ in. It can be adjusted vertically, $1\frac{1}{4}$ in., laterally, $3\frac{1}{4}$ in., and longitudinally, 4 in. If desired a tilting table is also available. The machine is useful for quantity production work and to replace grinding wheels, and in many instances the milling machine. It has been used for filing up machine details, burring, and cleaning up die castings. Materials of all types can be dealt with, including any metal up to tool steel.

— 77 —

Hammer, Drop-Stamp, Four Guide-Bar

B. & S. Massey, Openshaw, Manchester, England. [Vol.69, p.293E]

A four-guide-bar arrangement has been provided on the friction drop stamps manufactured by the above company. This provision has been made because of the difficulty experienced of the dies twisting at the moment of impact with consequent misalignment of the stampings. A



special steel hold-up prop is provided on to which the drop head can be lowered between the blows and for cleaning the dies, and re-setting. Six stud blocks hold the lower die. The guide bars rest in tapered sockets in the anvil block and are adjusted at the bottom by screws. At the top they are held in a strong housing in the top girder, each guide bar being kept in its position by wood packing and hair felting. Single battery-form, friction drop stamps of this type are available in a number of standard sizes from 5 to 15 tons.

— 78 —

Marking Machine, Bench-Type

J. Ackworthic, Ltd., Coleshill St., Birmingham, England. [Vol.70,p.33E]

This bench-type machine is used for rolling names, sizes, etc., on circular articles such as twist drills. It will mark pieces up to 6 in. in diam. The hand lever moves the slide carrying the marking punch by rack and pinion, and the pressure of

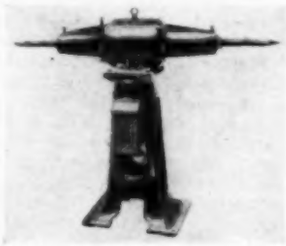
marking is taken upon roller bearings. The table is 10x6 in., length of stroke, 4 in., and total height of the machine, 17 inches.

— 79 —

Polishing Machines

W. Canning & Co., Ltd., Gt. Hampton St., Birmingham, England. [Vol.70,p.19E]

Extra bearings for the spindle are provided by a snout at each side of the motor. The bearings are dustproof and the a.c. motor



is entirely inclosed. Five standard sizes from 1 to 5 hp. are available.

— 80 —

Riveting Machine, Noiseless

Selson Engineering Co., Ltd., London, E.C., England. [Vol. 70,p.79E]

The riveting machine manufactured by Max Hasse & Co., Berlin, Germany, is marketed through the above British agent. Riveting is done by rolling on the rivet heads by two rollers at the end of the riveting tool, on which the form of the head to be made has already been produced. The machine is spe-

cially suitable for riveting delicate materials, such as porcelain, ebonite, hard rubber, and other substances. Pressure on the foot-lever causes the rivet head to be formed.

The table can be adjusted vertically according to the size of the parts to be riveted, the anvil also having fine adjustment. The machine is suitable for riveting up to $\frac{1}{4}$-in. rivets. It can be driven by a belt or by an electric motor. Main specifications are: Distance between tool and table, $8\frac{3}{4}$ in.; vertical movement of spindle by means of foot lever, $\frac{3}{4}$ in.; gap, 8 in.; speed of spindle, 1,700 r.p.m.; size of table, 8x11 in.; hp. required, $\frac{1}{2}$ to 4; height of machine, $52\frac{1}{2}$ in.; space occupied, 31x16 inches.

— 81 —

Saw, Friction, 52-Inch Foundry Type, Mars

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.70,p.96E]

In this Mars friction saw, the blade runs at high peripheral speed, melting the material cut, but the heat generated is of such short duration that hard spots are not created. The saw

blade is knurled on the periphery and also notched to provide clearance. When the knurling has been worn down by use, it can be re-roughened, a knurling apparatus, and also an attachment for milling notches being provided. The blade is driven by a 60-hp. motor. The saw head can be adjusted horizontally by rack and pinion to bring it into position relative to the edge of the table and can be adjusted vertically by a 3-hp. motor. The head swivels 20 deg. either side of the vertical.

Work is mounted on the eight-sided table, which is 9 ft. in diam. When the cut is finished the blade is returned to its original position and the table can be rotated by power. The machine will cut up to 6 in. in diam. in cast steel, the time required being about 110 sec. A larger machine with a 100-hp. motor to cut up to 8-in. rounds in cast steel is also available.

Weight, 60-hp. model, 8 tons.

— 82 —

Screw Machine, Full-Automatic, Six-Spindle

A. C. Wickman, Ltd., Coventry, England. [Vol.70,p.68E]

This six-spindle, full automatic screw machine is made by A. H. Schütte, Cologne, Germany. It is for bar work up to $2\frac{1}{4}$ in. in diam., and the spindles are arranged to operate in sequence. It can be built, however, to operate as a double, three-spindle automatic. Also, it may be supplied as a machine for handling castings, forgings

and stampings up to 8 in. in diameter.

The bar machine is of the drum type, the spindles being brought to their respective positions by the rotation of a drum in which they are carried. Short spindle nose reduces overhang. Thirty work speeds are available, the range being from 80 to 800 r.p.m. Eighteen tool carriers are provided, distributed so that each tool has complete freedom of operation. Six cross-sliding tool carriers are located around

the circular layout of the work spindles. Six tool carriers are mounted in the main tool slide on the bed. The remaining six tools are carried on a central hexagon tool block immediately in front of the main tool slide.

Maximum length of feed is 9 in., and rate per revolution is from 0.0028 in. to 0.038 in. All tools have rapid return motion. High-speed drilling, reaming, and threading attachments can be applied as independent interchangeable units. Drive is by a constant-speed single pulley through an adjustable friction clutch. Alternatively, a chain drive is available from a constant-speed motor.

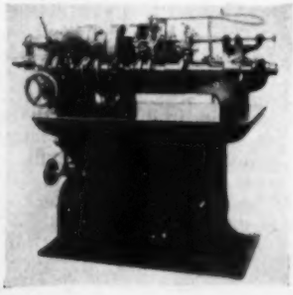
Weight 16,500 pounds.

— 83 —

Screw Machine, Full-Automatic, Single-Spindle

Selson Engineering Co., Ltd., London, England. [Vol.70,p. 119E]

The machine is driven from a 1½-hp. self-contained motor carried in the body. This motor differs from the usual type in that the rotor is the external member instead of the internal. Thus the outer casing rotates and an extension in the form of a four-step pulley drives the machine spindle by belt. The changes from one step to another are effected by a simple lever movement. The spindle carries a single pulley, the slow-speed reverse being obtained



through double-helical gearing and friction cone clutches operated from the front camshaft. The spindle is hardened and ground and runs on a combination of roller and ball journals with ball thrust.

Bars are quickly changed by inserting or withdrawing the feed tube. All motions are actuated from two camshafts, the first at the front and the second occupying a similar position at the rear. All cams are easily accessible either for changing or setting and all motions have quick return. The cross-feed toolholders are of pivoting type and are operated independently from four cam disks, two on the front camshaft and two at the rear. A powerful cutting feed is obtained by a 2:1 ratio of leverage. An eccentric bushing at the fulcrum adjusts the position of the cut above or below center. For controlling the diameter setting, each toolholder has a device for adjusting the round-nose pegs which have contact with the cam. By this means the toolholder is pivoted independent of the cam. The length-feed tools are carried in a cross-sliding turret, which accommodates three toolholders set in line at right angles to the work center. A turret for one or two toolholders can also be supplied. The turret slides across to bring each tool in turn on the center for cutting. The length feed is effected by the pusher rod. Drive for the camshafts is transmitted through steel worms and bronze wormwheels from the back driving shaft. The largest bar dealt with is ¾ in., with a turning capacity of 2 7/16 in. long and a drilling feed of 1 7/16 in. The largest thread cut is ¾ in. in diam., the maximum length being 2 in.

Floor space, 5 ft. 3 in. x 3 ft. 4 in., weight is 1,940 lb. net.

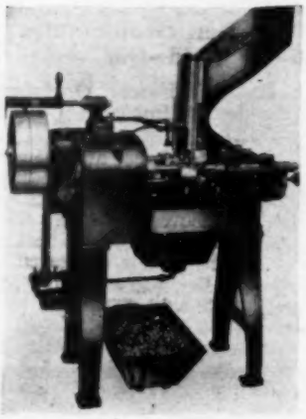
— 84 —

Tapping Machine, Nut, Two-Spindle, Automatic

Gebr. Hubner, Chemnitz, Germany. [Vol.70,p.106E]

This two-spindle automatic machine for tapping nuts is used preferably with cold-pressed square or hexagon steel nuts. Continuous threading is possible without removing the tap. The taps are held in a special chuck and can be readily taken out.

The nuts are emptied into a sloping hopper and distributed right and left into the feed channels by a slide. The feeder at the lower end of each channel detaches one nut at a time and presses it against the revolving tap. The two feeders are drawn back in succession by an eccentric drum and the feed pressure is obtained from springs. Each feeder can be put out of operation individually. Similarly, by throwing out the eccentric drum the slide can be stopped simul-



taneously with the two feeders.

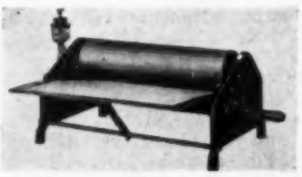
The tapped nut is dropped through a channel into a box below, and is separated from the chips. Drive is by tight and loose pulleys controlled from each side of the machine, or may be direct by means of a separate motor.

— 85 —

Copying Machine for Sketches

W. Block and A. Anderson, 3, Snow Hill, E.C., London, England. [Vol.70,p.108E]

The above have introduced a copying machine for sketches and shop instructions. The original is made over a sheet of hectograph paper and the impression thus obtained on the back of the original can be used to produce about 200 copies. The machine is hand-



operated and the main roller geared to a hand lever. A roller of smaller diameter is located immediately below and the pressure for feeding the work through is applied by a small handle on the left side of the machine. On this side is also a glass syphon containing methylated wood alcohol, which is fed to a pad in contact with the roller. The original is fixed to the main roller by means of a special sector which is removable.

— 86 —

Cutting Machine, Oxy-Acetylene, Small

British Oxygen Co., Ltd., Edmonton, N., England. [Vol.70, p.159E]

This hand-operated machine is suitable for cutting small parts in steel plate direct from a drawing, sketch or blueprint, or from a templet, and is available in portable form or mounted on a table. A jointed pantograph frame is mounted on a fixed rectangular frame with table, on which the sketch or templet is held by clips. The ends of the pantograph frame have guides which slide on tubular bars. A pointer traces out the shape, the movements being reproduced by the pantograph at the cutter.

The machine will deal with material up to 4 in. thick and of any shape within a square 15 in.

on a side. To allow for uneven material, the cutter is adjustable for height.

Weight, 50 pounds.

— 87 —

Flexible Shaft Tools

F. Gilman (B.S.T.), Ltd., Smethwick, England. [Vol.70, p.59E]

The universal features of this flexible-shaft unit enables drilling, grinding, polishing, boiler-scaling, chipping, and other operations to be performed by merely changing the tools on the flexible-shaft head. The shaft is driven by a ½-h.p. motor suitable for any voltage up to 550 on either a.c. or d.c. circuits.

The drilling tools are available in two types. One, with bevel gear drive, drills up to ½ in. in mild steel. The other is for heavier drilling up to ¾ in.

in steel, the drive then being through a worm reduction gear.

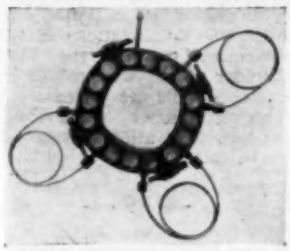
The chipping tool is of the mechanical percussion type. The blow is adjustable.

— 88 —

Propeller-Puller, Hydraulic

Hollings & Guest, Ltd., Birmingham, England. [Vol. 70,p.21E]

For removing steamship propellers from shafts, and similar classes of work, this machine has been developed. It is built



up of segments, allowing it to be placed over the shaft. Holders are provided to take the load. The segments are held together with long bolts to suit different diameters of shafts. The body and rams are of forged steel. The machine is worked by a hand pump, only one pump connection being necessary, as all rams are connected together. It is made in types and sizes to suit propellers and shafts of various diameters. On shafts from 13 to 18 in. in diam. the pressure is 230 tons. For shafts up to 26 in. in diam. the pressure is 300 tons.

The whole machine is small and light for convenient handling in a confined space.

Balancing, Gaging and Testing Equipment

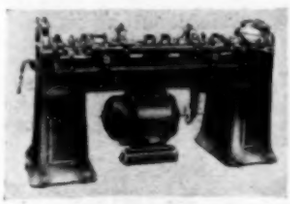
— 89 —

Balancing Machine, Dynamic

W. & T. Avery, Ltd., Birmingham, England. [Vol. 70,p.31E]

Crankshafts and similar products can be tested for out-of-balance under running conditions on this dynamic balancing machine, and by means of small weights provided at each end, the vibration set up by the unbalanced rotating body can be neutralized, readings being taken at each end when the machine is stopped.

Dial indicators show the lateral displacement of the cradle



and when movement can be seen at either end it is eliminated by a movement of the compensating weights. When the shaft is running without oscillation at either end, the machine is stopped, the angle of eccentricity is ascertained, and the displacement of the compensating weights is read from the scale. The points can thus be seen at which the body is out of balance and the superfluous metal can be machined or filed away.

— 90 —

Checking Machine for Gap Gages, Krupp

Coats Machine Tool Co., Ltd., Palmer St., London, S.W., England. [Vol.70,p.173E]

The Krupp indicator gage has been modified so that it will test the gaps in gages as shown. The gap gages to be tested are passed over the feelers and any

variation in size is indicated on the "Mikrotast," which is a standard instrument. The same device can also be used for checking ring gages and to control internal thread diameters, the latter necessitating the use of special jaws. When testing the effective diameters of internal threads, the sleeves are used for centering the threads and the jaws are set to standards.

For setting the feelers, fine adjustment is provided to the lower jaw by a screw, and both the measuring arm and the pressure operating the measuring springs inside the arm can be adjusted. The arm has ball bearings inside the tube both for ease of adjustment and for accuracy, enabling limits as low as 0.00004 in. to be checked. Gap and ring gages from ¼ to 4 in. can be tested with this instrument.

— 91 —

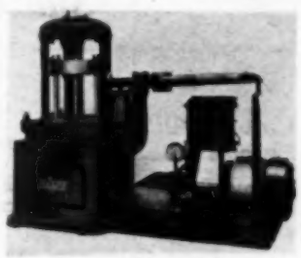
Testing Machine, Universal, 50-Ton, Compound-Lever

W. & T. Avery, Ltd., Soho, Birmingham, England. [Vol. 70,p.46E]

A testing machine with a wide range of speeds from 0.1 in. to 8 in. per min. has been placed on the market. Maximum length of tension specimens handled is 24 in., and round bars up to 1¼ in. in diam. and flat bars up to 2x¼ in. can be tested. Maximum length of compression specimen is 24 in., maximum span of bending specimen 36 in., and maximum size of shearing specimen ⅞ in. in diameter.

Three columns, attached to the platform, support the upper tension head, carrying wedge grips for tensile specimens. A transfer lever transfers to the steelyard the load applied to the weighing table, or upper tension head. A micrometer screw dial enables readings to 0.001 tons to be obtained.

The testing unit consists of a crosshead supported by three screws, operated by rotating



nuts at the base of the machine, driven from a central worm gear. Compression tests are carried on by placing the specimen on a flat platen fitted to the weighing table. The load is applied by the crosshead. Bending tests are carried on by fitting two supporting brackets to the weighing table. Shearing tools are placed on the weighing table and the load applied as in a compression test.

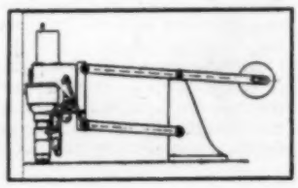
The machine is driven by a variable-speed motor with a three-speed gearbox. A clutch enables the crosshead to be stopped without shutting off the motor. Tachometers show the speeds of the crosshead for each gear. The machine is intended for high-speed testing, giving a pull of 50 tons at 2 in. per min.

— 92 —

Testing Machine, Hardness, for Abrasive Wheels, Zeiss

Dowdings' Machine Tool Co., Ltd., London, S.E., England. [Vol.70,p.95E]

This Zeiss apparatus for testing hardness of abrasive wheels is based on the cutting action of a sand jet and will pass over the full surface of wheels up to one meter, or 39⅜ in. in diam., the maximum width of



grinding wheel admitted being 10¾ in. The tester is claimed to be easily operated and to be both rapid and safe in working. A storage tank holds sufficient sand for 15 to 20 tests.

When the contents of the measuring tank have been blown through on to the area of the wheel under test, a process which occupies about 6 sec., the depth of the hole eroded by the blast is shown by graduations on the dial, the pin, of course, having been previously set to zero. The sand should be preferably flint standard II, or about 0.8 mm. grain. For testing soft, fine-grain abrasive wheels, a pressure of about 0.5 kg. per sq.cm. is sufficient, but for hard, coarse-grained wheels the pressure is increased to about 45 lb. per sq.in., so as to produce holes from 1½ to 2 mm. deep.

Overall dimensions are 47½x 19⅝x26½ in. high.

— 93 —

Hardness Tester, Rebound-Principle

Dowdings' Machine Tool Co., Ltd., Vauxhall, S.E., England. [Vol.70,p.105E]

The above firm is British agent for a rebound-principle hardness tester in an improved form made by Schuchardt & Schutte, Berlin, Germany. The hammer of the machine, after striking the object under test, is caught and held at the top position of the rebound, thus rendering accurate observation

easy. Increase in hammer weight gives more accurate results. The hammer weighs ¾ oz., and the fall is 4½ inches. The round end of the diamond used leaves but a small impression on the work.

The hammer slide can move vertically in a dovetail groove in the stand, and is adjusted by handwheel and rack gearing, by which it can be pressed against the test piece. The stand will admit work up to 4 in. thick. For larger work the hammer slide is removed from the stand and used freehand. The instrument has a spirit level and two screws for lining-up and the anvil is hardened and has a flat top for flat

work, or for cylindrical work a V-shaped anvil is available. The fall of the hammer is guided in a long tube.

— 94 —

Testing Machine for Small Coil Springs

Coats Machine Tool Co., Ltd., Palmer St., Westminster, S.W., England. [Vol.70,p.158E]

This item was described in the American Section on p. 950, Vol. 70 of the *American Machinist*. It is reviewed under item No. 217 of the American Section of this issue.

— 95 —

Inspection Instrument for Internal Surfaces, "Introscope"

Foster Instrument Co., Letchworth, England. [Vol.69,p.333E]

Available in different sizes, the "Introscope" is used for the inspection of bores and other internal surfaces. The smallest size is ¾ in. in diam. by a maximum of 2 ft. in length. Minute inequalities in the surface ex-

amined are thrown into high relief. Wide limits of magnification are obtainable.

One end of the instrument is inserted into the bore, an eyepiece being located at the other end. The image formed at the objective is transmitted by a system of reversing lenses to the eyepiece. A small battery-operated lamp furnishes illumination. A camera may be fitted to the instrument.

— 96 —

Projector for Toolroom Work

Dowdings' Machine Tool Co., Ltd., Vauxhall, S.E., England. [Vol.70,p.107E]

The above company is British agent for a new Zeiss projector for toolroom work, measurement of contours, testing templates, form tools, screw threads, gear tooth shapes, turbine blades, etc. The projector is made by Schuchardt & Schutte, Berlin, Germany. The projected image of the object is compared with an enlarged drawing made to scale, the size being checked either by comparison or by measurement with rule or vernier. The work is placed on a horizontal table and is neither fastened nor specially set up. The screen is likewise horizontal so that templates or drawings need not be fastened.

The instrument can be used in daylight, is strong, and can be protected with a black cover. Standard lenses provide three ranges of magnification, 25, 50 and 100, the corresponding sizes of objects being ⅜, 1/16, and 3/32 in. in diam., respectively. Focussing is by means of a knob on top of the mirror and graduations.

The table may be either circular with centering arrangement, or compound. The compound table has a travel of 2 in. longitudinally, and 1 in. across, adjustment being made by micrometers reading to 0.01 mm. and end rods. The table has a swivelling top, tilting 12 deg. from the horizontal. Screw threads may be inclined to their helix angle, the swivel motion being set to graduations. The

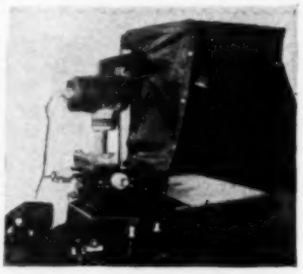


table will also carry centers.

The table is moved through rack and gearing, the adjustment being 3½ in. The space between the condenser and the table allows objects up to 4¾ in. high to be tested.

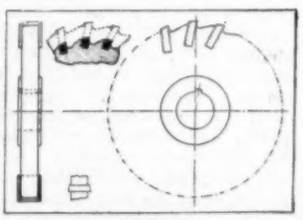
Small Tools

— 97 —

Cutters, Milling, Fused-Blade, "Cardinal"

Brooke Tool Manufacturing Co., Ltd., Greet, Birmingham, England. [Vol.70,p.189E]

This series of milling cutters have inserted blades homogeneously amalgamated with the cutter body by fusion, so that, it is claimed, the cutter is virtually solid. While the blades may be of 18 per cent tungsten steel or of tungsten-cobalt-chromium alloy, as required, the body is formed of medium tensile steel. The slots are cut in the body to receive the blades and are inclined to the radial. The blades have small lips or flanges formed at the sides, to register



with the sides of the body, and the periphery of the latter is shaped so that the tooth or blade projects at the front to form a cutting lip, while at the back it is reinforced by the body.

One purpose of the design is to insure that practically the whole of the blade can be utilized. The dotted lines indicate the original form of the cutter and body, while the full lines suggest the minimum size. As the blade wears and therefore has to be ground back, the body is slotted or milled to insure that sufficient of the blade length shall project to form the necessary cutting edge.

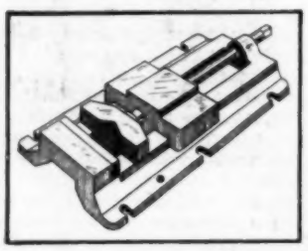
Body material of low value is removed to allow full working use to be made of the entire length of the relatively expensive cutter. It is claimed that impact shocks are better absorbed by this construction than by solid cutters of the same material as the teeth. The system can also be applied to facing heads, shell end mills, plain mills and reamers. Side-and-face and slotting cutters are available from stock in sizes ranging from 3 by ⅛ by 1 in. with 12 blades, to 8 by 1½ by 1¼ in., or 1½ in., with 24 blades. Cutters with finer or coarser pitch of tooth are also available.

— 98 —

Vise, Machine, Quick-Acting

G. H. Alexander Machinery, Ltd., Birmingham, England. [Vol.70,p.116E]

This quick-action vise is manufactured by C. Steinhause & Co., Kabel, Germany. It can be mounted direct on the table of the machine or on a swivel base. The movable jaw can be pushed quickly by hand along



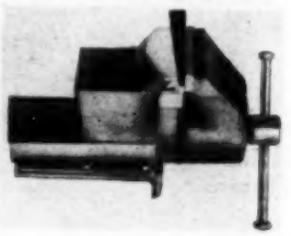
ways and thus brought immediately into contact with the piece to be held, the screw then being given a part revolution in order to effect the grip. While the moving jaw is being pushed into position, the nut is free to slide with it. The nut exerts wedge pressure against movable pieces transverse to the screw, and these pieces are forced against the faces on the base of the vise, and by this means lock the nut in position. The screw can then be operated as usual to apply the pressure. To release the jaws the screw is simply turned in the opposite direction, continuation of the movement causing the inner shoulder of the ball end of the screw spindle to release the wedging action by withdrawing the nut, thus allowing the jaw to be moved freely by hand.

— 99 —

Vises for Taper Work

Danner & Co., Basel, Switzerland. [Vol.70,p.189E]

These vises for both bench and machine use are specially arranged for securing taper and irregularly-shaped work, but



are equally useful for securing ordinary parallel or cylindrical work. The body is of cast steel. The jaw against which the clamping screw bears has a simple sliding motion, but the opposite jaw can swivel in a circular path so as to adjust itself to the shape of the object being secured. It is designed to avoid upward pressure due to the clamping action. The guide for the other jaw is adjustable so that wear can be compensated for.

Machine vises of this type are available in four sizes, with jaws from 2¾ to 6 in. wide to open from 2¾ to 7 in., respectively. Bench vises can also be had in four sizes with jaws from 3 to 6 in. wide and openings from 5¼ to 8 inches.

— 100 —

Expanding Tool, Tube, "Pearn"

Smith & Coventry, Ltd., Manchester, England. [Vol.69, p.292E]

This adaptation of the "Pearn" tapper has been made to meet the requirements of the boiler-making and shipbuilding industries. Because the ordinary tube expander is unsatisfactory when driven by machines having no means of slip-

ping when the tube is expanded, the tapper has been modified so that the expander can slip when the tube is fully expanded and thus prevent breakage. The slipping mechanism can be adjusted to suit various tube sizes and conditions.

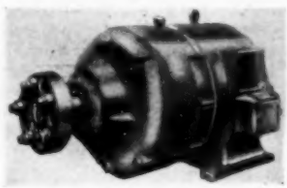
Transmission Equipment

— 101 —

Speed Reducers, Geared-Motor

Crofts (Engineers), Ltd., Thornbury, Bradford, England. [Vol.69,p.261E]

This line of geared-motor drives consists of a.c. motors with concentric reduction gearing, self-contained. The drives have been standardized in a number of sizes and the concentric gearing can be supplied without the motor if desired. The reduction gearing employed



consists of a concentric gear on the planetary principle, the planet pinions engaging a fixed internal wheel, and the motion then being taken off the planet element to the low-speed shaft. Double-reduction gears on the same principle are also available.

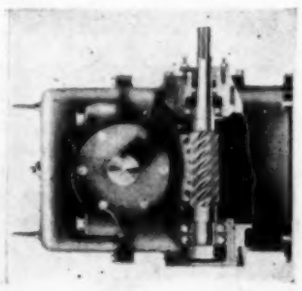
Single gears are made in two types, light and heavy, to transmit up to 50 hp., and a double type is available up to 15 hp., the speed reduction being about 7 to 1 as the maximum in the case of the single set and 40 to 1 for the double set. Gears of the light type have fabric pinions, but heavy single types and also the double types have steel gearing throughout. The unit is compact.

— 102 —

Speed Reducers, Worm Gear

C. J. Fitzpatrick & Co., King St., Acton, W., England. [Vol. 70,p.190E]

Four types of speed reducers are manufactured. The first has the worm mounted below the wheel and is designed for overhung loads. The second is a standard drive with the worm over the wheel, the third consists of a range of small units up to 3½ in. centers, and the fourth is a self-contained set



arranged to drive a vertical shaft which extends above, the same type being available with the vertical shaft extending downwards. In these worm gear reduction units, the worm with shaft is a solid alloy steel forging, hardened, ground and polished. The wheel is of pressure-cast phosphor-bronze, keyed and shrunk on a cast-iron center. Ball bearings are used for the wormshaft, while the bearings for the wormwheel shaft are usually of the taper roller type. The larger sets have plain journals of low unit pressure and thrust bearings. The shafts are standardized as to the diameters and keys and can be extended in either direction.

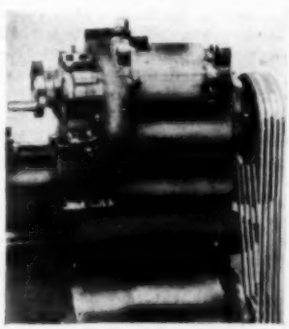
These speed reduction gears are made in twelve standard sizes. The small units are made in ten different ratios to transmit up to 3 horsepower.

— 103 —

Drive, V-Rope, "Sure-Grip"

Crofts (Engineers), Ltd., Thornbury, England. [Vol.69, p.237E]

This "Sure-Grip" endless V-rope drive is especially applicable to short-center drives of all descriptions. The rope is flexible and is supplied in endless form. The rope and the grooves in the pulleys are of V-shape with a 40-deg. angle, the ropes being built up of straight cotton strands impregnated under pressure and in tension with a composition having



rubber as a base. It is claimed that the rope will not stretch. The material is not affected by moisture and requires no dressing or lubrication.

The ropes are available in a number of sections between ½ in. wide by $\frac{5}{16}$ in. deep and 1½ in. wide by 1 in. deep, and the speed may be from 750 to 6,000 ft. per min. The minimum diameter on which the smallest section will run is 3½ in., and for the largest sections, 17½ in. The ropes are made up in a number of standard lengths according to section.

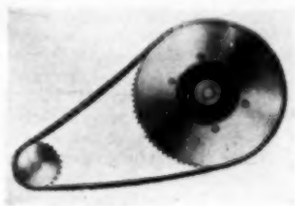
Standard self-contained drives with motors and baseplates complete are available in a number of sizes to transmit up to 200 hp. and with speed ratios up to 7 to 1.

— 104 —

Plate Wheel Adapters for Chain Drives

Hans Renold, Ltd., Didsbury, Manchester, England. [Vol.70, p.59E]

In connection with its chain drives, the above firm is now supplying plate wheel adapters, together with a range of change wheels to meet the requirements of machines in connection with which a range of speeds is



needed and quick change is essential. These have been employed as prime mover drives from motor to the machine, but can be used for varying speeds from shaft to shaft. Three sizes of chain are provided, ½-, ⅝-, and ¾-in. pitch with an alternative adapter for the ⅝- and ¾-in. pitch chains.

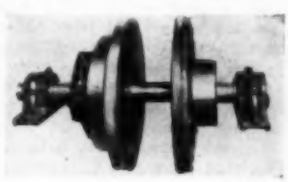
— 105 —

Clutch, Magnetic, for Machine-Tool Drives

Rapid Magnetting Machine Co., Ltd., Lombard St., Birmingham, England. [Vol.70,p. 20E]

This totally-inclosed magnetic clutch is used for lineshaft drives for power transmission, machine tools, steam winches, haulage gear, etc. Where the shafts are continuous, one side of the hub is fitted with a bushing to revolve on the shaft. Where shafts are divided, both members of the clutch are keyed on the respective sections.

The clutch body contains an electric coil, which attracts the



armature on the other clutch member, deflecting a steel spring plate and engaging the friction surfaces, which are provided with asbestos and metal facings, forming a heat-resisting material with a high coefficient of friction. The steel spring plate is mounted on the hub, gear wheel, or other parts of equipment to customers' requirements. Coils are wound for d.c. circuits up to 250 volts. The engagement is either direct, or gradual by means of a controller when the clutches are in motion. The clutches are standardized in sizes from 6 to 60 in. in diam., or larger on special order.

— 106 —

Belt Shifter, Safety-Type

O. N. Beck, 11 Queen Victoria St., London, E.C., England. [Vol.70,p.9E]

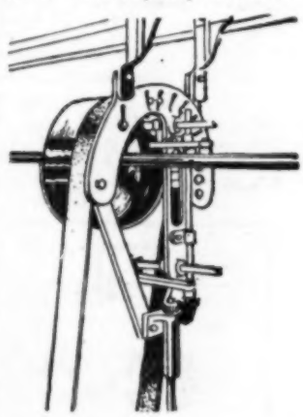
This belt shifter is intended for belts up to 4½ in. wide. It consists of a jointed flexible arm built up of a number of members through which a chain passes pressing the members together. At the upper end the arm carries a horizontal pin lifting the belt, this pin having a wheel which prevents the belt from slipping off. The flexible arm is held in place by a spring in the shaft and the tension of the spring is sufficient to lift the belt and mount it on a pulley. The mounter is attached to a wooden pole, the whole length of the apparatus equaling the height of the shafting above the floor level, minus about 20 inches.

— 107 —

Belt Shipper

J. Broughton, Vere St., Birmingham, England. [Vol.70,p. 33E]

The belt shipper is controlled from the floor by a handwheel at the end of a rod, bearing at the opposite end gearing by which a system of links is operated. A half turn either way places the mechanism in operation. On the pulley side of the



frame are fitted a series of roller-covered pins and an aluminum perch. The rollers are on the intake side and the belt is moved by a finger device and an aluminum plate which acts as a brake and brings it to rest as soon as it leaves the pulley.

Belt shippers are available for pulleys of practically any size and for open, crossed, and twisted belt-drives. For use, they are suspended opposite the pulley.

Miscellaneous

— 108 —

Dryer, Mold, Portable, Self-Contained

Pneulec, Ltd., Smethwick, England. [Vol.70,p.32E]

The portable mold dryer manufactured by the above firm is a self-contained unit supplied complete with blowing fan. Hot gases from the fire box, after being tempered down, are forced into the mold in large volume and at a velocity sufficient to

give even distribution of heat. The dryer is used also as a fire box on small plenum system stoves. Hot gases are discharged into the inlet flues and distributed in exactly the same way as with larger stoves fired with underground fire boxes.

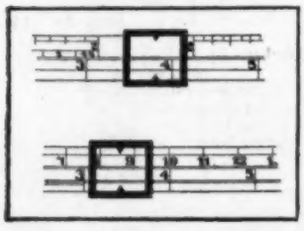
On a test a mold weighing 13,000 lb., and measuring overall 7 x 6 ft. 6 in. x 7 ft. was dried in 16 hours, with a total coke consumption of 700 pounds.

— 109 —

Cursor for Scales, English and Metric Conversion

Wm. H. Grant, 122 North St., Charing Cross, Glasgow, Scotland. [Vol.70,p.85E]

The cursor is a rectangular metal frame sliding along the rule and inclosing it. It has a pointer at the top and bottom by means of which dimensions



can be read. Inches and fractions can be converted into millimeters or millimeters into the corresponding English dimensions.

The cursor device applies to both sides of the steel rule. Hence if the rule is marked in inches, with the corresponding tapping sizes and spanner sizes, the latter can be read at once. The device is intended for draughtsmen, pattern-makers, engineering workmen, and men in similar occupations.

— 110 —

Filing Cabinets for Drawings and Tracings

Pan-Clip Co., 3 Snowhill St., London, E.C., England. [Vol. 70,p.130E]

Steel cabinets of various sizes, with sliding frames or rods from which are suspended removable clips for carrying drawings, tracings, and blueprints, are available. The drawings are carried by the clips in batches up to fifty. One of the standard cabinets accommodates 60 clips, providing a capacity for 3,000 drawings.

Another type of cabinet, in which the drawings face outward, is also made. Here the clips are carried on a sliding frame, which is pulled outward from the cabinet to allow easy access in removing the desired clips. Each clip consists of a spring holder and back and front metal plates. These plates are V-shaped, and the tops of the drawings are folded over

to fit within this V. Clips are available in nine sizes, ranging from 13 to 63 in. wide, and for clips of 28 in. and over, auxiliary end springs are supplied to take the extra weight. Each clip has two outer cover sheets.

Clips can be used independently of cabinets to store drawings at different drafting boards. A tubular section table stand is also available for the same purpose. A floor stand of similar design will take twenty clips with a capacity of 1,000 blueprints. It can be set at any desired height up to 6 ft. 6 in., so that drawings of any length can be accommodated.

— 111 —

Furnace, Electric, Portable

Birmingham Electric Furnaces, Ltd., Birmingham, England. [Vol.70,p.47E]

A small portable furnace for operation on single- or two-phase current, and having a hearth 30x6 in., has been placed

on the market. The maximum rating is 16 to 18 kw. The furnace consists of a welded-steel cylinder lined with refractory and insulating material. The hearth is flat and covered with a nickel-chromium plate. Heating elements are nickel-chromium strip of sinuous form, and are mounted in the roof, sides and hearth, and together with the circular construction, are claimed to give even distribution of heat. Resistors are protected from accidental contact by nickel-chromium sheet. Sil-o-Cel insulation is installed.

The door is of the parallel-motion type, tight-closing, and lined with refractory material and insulation. Opening the door cuts off the current. A false back incloses all electrical connections. Automatic temperature control is supplied, maintaining any temperature up to 1,000 deg. Centigrade.

— 112 —

Indicator, Stock Control

Fox & Offord, Ltd., Alma St., Birmingham, England. [Vol. 70,p.34E]

The balance-of-stores indicator is made for two types of operation. Where small quantities are dealt with, the mechanism is controlled by a press-button system in two rows, one for receipts and the other for issues. For large quantities, a dial and plunger system is employed with a series of plugs above for receipt and below for issues. In the dial transmitter, the handle is turned on the dial to the figure showing the quantity dealt with, and on release it works back to the zero position to show the stock balance.

In smaller sizes these appliances are built in units, each

containing twelve vertical indicating plates, one for each class of article handled. The tapes carry a pointer working over a scale to indicate quantity in stores. The minimum stock to be kept is shown by a red mark on the plate. The apparatus is operated by electromagnets. Each metal strip or tape operates for one material. The pressing of a button in the smaller instrument records a unit rise or fall so that the number indicated corresponds to the number of times the button is pressed.

— 113 —

Microscope, Metallurgical, Universal

W. Watson & Sons, Ltd., 313 High Holborn, London, W.C., England. [Vol.69,p.236E]

This metallurgical microscope is for visual examination by transmitted light for general work, and reflected light for photomicrography, projection, comparison, and drawing, and is simple to use. A double illuminating system is provided, the radiants being arc and "Pointolite" lamps mounted at right angles to each other.

For metallurgical work, the object is mounted on the stage, provided with centering screws which give a range of travel of ¾ in. For micrographic objects, a supplemental stage on geometric bearings is fitted, which permits the use of long-focus photographic objectives.

Visual fatigue is prevented by the examination, on a screen at a height of 3 ft., of the projected image. The device can be used for drawing by mounting tracing paper on a plain glass plate in lieu of the ground glass focusing screen, for exact measurement of areas by means of a planimeter, for comparison purposes, and for photomicrography. The apparatus itself is constructed of angle iron, welded and covered with steel sheet.

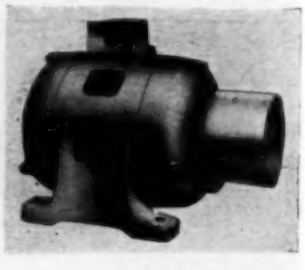
Floor space 3 by 2 feet.

— 114 —

Motors, Induction, Standardized

British Thomson - Houston Co., Ltd., Rugby, England. [Vol.70,p.107E]

A range of inclosed, squirrel-cage induction motors, known as type K, in sizes from 1 to 25 hp., 400 to 440 volts, three-phase, 50 cycles, is available. For these motors high efficiency and power factor, maximum starting and overload torque, and low starting current are claimed. They are equipped with ball and roller bearings.



The rotor has aluminum bars and end rings cast in one piece by a special process. The core is ground on the periphery to insure true running. The stator windings are specially dried and impregnated under vacuum.

— 115 —

Pyrometer

Viozone, Ltd., 19, Cursitor St., London, E.C., England. [Vol.70,p.117E]

This pyrometer can be used by ordinary workmen and it requires no adjustment or setting. Temperatures from 500 to 1,400 deg. C. can be observed. The instrument consists of a calibrated frame about 9 in. long, and a center piece of glass shaded from clear to

opaque along the length covered by the calibrations. The frame also carries a square slide with a hole in the center and locating over the strip of shaded glass. For taking temperatures, the hot body is sighted through the hole in the slide. The latter is then adjusted along the frame, and at the point where the glow of heat disappears the slide is retained. The temperature is then indicated by the left-hand edge of the slide on the scale. Temperatures can be taken at a distance most convenient for the operator. The eyepiece shown is for use at high heats.

— 116 —

Tool Cabinet and Workshop Stand, Steel

Chatwood Safe Co., Ltd., Shrewsbury, England. [Vol.70, p.130E]

This steel workshop stand and tool cabinet has the door secured by the Chatwood six-lever lock. The locks come in a wide range of combinations and a master key will operate all locks for a series of cupboards.

The bodywork and the shelves of the stand are of No. 18 and the cupboard door of No. 12 gage steel, the framework being of 1½x1½x¼-in. steel angles. The cupboard is intended for small tools, machine accessories,

partly-finished work, and drawings. Overall size, 19 in. wide x 15 in. deep x 3 ft. 3 in. high. Color, olive-green.

INDEX OF MANUFACTURERS

European Edition

— A —

	No.	Page
Ackworthie, Ltd., J., Coleshill St., Birmingham, England		
Swivel centers for milling machines	62	142
Bench-type marking machine	78	145
Alexander (Machinery) Ltd., G. H., Birmingham, England		
Cylindrical and plunge-cut hydraulic grinding machine	24	135
Vertical-spindle hydraulic motor-driven surface grinder	32	136
Universal hydraulic grinder	33	137
Quick-acting machine vise	98	148
Appleyard & Co., S., Boothtown, Halifax, England		
All-steel shears for bar-iron	72	144
Asquith, Ltd., W., Halifax, England		
Two-spindle, crossrail-type drilling machine	8	132
Special horizontal drilling machine	14	133
Horizontal drill for large drums	17	133
Two-spindle, vertical, continuous milling machine	60	141
Avery, Ltd., W. & T., Birmingham, England		
Dynamic balancing machine	89	147
Universal compound-level testing machine, 50-ton	91	147

— B —

	No.	Page
Beck, O. N. 11, Queen Victoria St., London, E. C., England		
Safety-type belt shifter	106	149
Biernatzki & Co., Chemnitz, Germany		
Vertical milling machine with twin-pillar knee support	61	141
Birmingham Electric Furnaces, Ltd., Birmingham, England		
Portable electric furnace	111	150

— B —

(Continued)

	No.	Page
Block & Anderson, 3, Snow Hill, E. C., London, England		
Copying machine for sketches	85	146
British Oxygen Co., Ltd., Edmonton, N., England		
Small oxy-acetylene cutting machine	86	146
British Thomson-Houston Co., Ltd., Rugby, England		
Standardized induction motors	114	150
Brooke Tool Manufacturing Co., Ltd., Greet, Birmingham, England		
"Cardinal" fused-blade milling cutters	97	148
Broughton, J. Vere St., Birmingham, England		
Belt shipper	107	149
Burnell, J. E., Llanelly, England		
Rail and pipe bending machines	74	144

— C —

	No.	Page
Canning & Co., Ltd., W., Gt. Hampton St., Birmingham, England		
Polishing machines	79	145
Carter & Wright, Halifax, England		
Bevel angle shear	70	144
Chatwood Safe Co., Ltd., Shrewsbury, England		
Steel tool cabinet and workshop stand	116	150
Coats Machine Tool Co., Ltd., Palmer St., London, S. W., England		
Krupp checking machine for gap gages	90	147
Testing machine for small coil springs	94	147

— C —

(Continued)

	No.	Page
Crofts (Engineers) Ltd., Thornbury, Bradford, England		
Geared-motor speed reducers	101	149
"Sure Grip" V-rope drive	103	149
Cromwell Engineering Co., Ltd., Folshill Road, Coventry, England		
Ring and disk surface grinder, 8-inch	29	136
Craven Bros., Ltd., Manchester, England		
Special long-hole, three-spindle, horizontal drilling machine	13	133

— D —

	No.	Page
Danner & Co., Basel, Switzerland		
Vises for taper work	99	148
Demag A. G., Duisburg, Germany		
Drill sharpening and upsetting machines	38	137
Dowding & Dickinson, Greycoat St., Westminster, S. W., London, England		
Gear hobber, 13-foot	19	134
Pfauter automatic worm and thread milling machines, Nos. S. F. 1 and S. F. 2	21	135
Dowding's Machine Tool Co., Ltd., Vauxhall, S. E., England		
Portable boring and honing cylinder machine	6	131
Gear tester	22	135
Zeiss hardness testing machine for abrasive wheels	92	147
Rebound-principle hardness tester	93	147
Projector for toolroom work	96	147

— E —

	No.	Page
Edwards, Ltd., F. G., 406, Euston Road, London, N. W., England		
Interior, hand-operated shears	73	144

— F —

Fitzpatrick & Co., C. J.,
King St., Acton, W., England
Worm gear speed reducers....102 149

Foster Instrument Co.,
Letchworth, England
"Introscope" inspection instrument for internal surfaces... 95 147

Fox & Offord,
Alma St., Birmingham, England
Planetary grinding attachment. 41 138
Stock control indicator.....112 150

— G —

Gilman (B. S. T.) Ltd., F.,
Smethwick, England
Flexible shaft tools..... 87 146

Grant, Wm. H.,
122, North St., Charing Cross, Glasgow, Scotland
English and metric conversion cursor for scales.....109 150

— H —

Herbert, Ltd., Alfred,
Coventry, England
Automatic double-headed, multiple-spindle piston boring machine 4 131
Special horizontal duplex drill.. 16 133
Light adjustable drillheads.... 18 133
Universal grinding machine.... 34 137
Turret lathe, No. 7, 8-inch..... 45 139
Capstan lathe with self-contained motor drive, No. 4..... 50 139
Redesigned car wheel lathe.... 52 140
High-speed vertical milling machine for aluminum and light alloys 59 141

Hollings & Guest, Ltd.,
Birmingham, England
Hydraulic propeller-puller 88 146

Hubner, Gebr.,
Chemnitz, Germany
Automatic two-spindle nut tapping machine 84 146

Hulse & Co., Ltd.,
Salford, Manchester, England
Planer-type milling machines... 56 141

Hunton, Ltd.,
Fitzroy Court, London, W., England
Punching and drawing presses.. 68 143

— J —

Jones (Machine Tools), Ltd., E. H.,
London, N., England
Semi-automatic crankshaft lathe 53 140

Jones, Ltd., S. G.,
Brixton Road, London, S.W., England
Cylindrical and plunge-cut grinder 25 135

— K —

Kendall & Gent, Ltd.,
Manchester, England
Four-spindle universal, planer-type milling machine..... 55 141

Kitchen & Wade,
Halifax, England
Four-spindle vertical drilling machine 7 132
Central thrust, radial-girder drilling machine, 8-foot..... 9 133
Special horizontal swivelling-head drilling machine 15 133

— L —

Loewe & Co., L.,
Berlin, Germany
Horizontal milling machine..... 57 141

— M —

No. Page

Massey, B. & S.,
Openshaw, Manchester, England
Four-guide-bar drop-stamp hammer 77 145

Mayer & Schmidt,
Offenbach, Germany
Internal and face grinding machine 27 136
Hydraulically-operated surface grinding machine..... 30 136

Muller & Montag,
Leipzig, Germany
High-speed vertical milling machine 58 141

— P —

Pan Clip Co.,
3, Snowhill St., London, E.C., England
Filing cabinets for drawings and tracings 110 150

Parkinson & Son, Jr.,
Shipley, England
Sunderland double-acting spur gear generator 20 135

Pittler Co.,
Leipzig, Germany
Flange-motor-driven turret lathe 48 139

Pneulec, Ltd.,
Smethwick, England
Portable mold dryer.....108 150

— R —

Rapid Magnetting Machine Co., Ltd.,
Lombard St., Birmingham, England
Magnetic clutch for machine-tool drives 105 149

Redman & Sons, Ltd., C.,
Halifax, England
All-geared motor-driven lathe, 9-inch 42 139
High-production planing machine 63 142

Reishauer-Werkzeuge, A. G.,
Zurich, Switzerland
Precision screw-thread grinding machine 35 137

Renold, Ltd., Hans,
Didsbury, Manchester, England
Plate wheel adapters for chain drives 104 149

— S —

Scott Bros., Ltd.,
Halifax, England
Rack-driven, plate-edge planer.. 65 142

Schütte, A. H.,
Cologne, Germany
Automatic threading lathe..... 54 140

Selson Engineering Co., Ltd.,
Hatton Garden, E.C., London, England
Large horizontal boring machine 1 131
Jig boring machine, No. 2..... 2 131
Jig and locating boring machines. 3 131
Semi-automatic four-spindle boring machine 5 131
Semi-automatic horizontal drilling and reaming machine.... 11 133
"Naxos" plain cylindrical grinder 23 135
Hydraulic internal grinder..... 26 136
"Naxos" five-side surface grinder 28 136
Camshaft grinding machine.... 37 137
Vertical-face magnetic chuck... 40 138
Capstan lathe, 4¼-inch..... 46 139
Turret lathe with flange-motor drive 47 139
Roller cutting-off machine 75 144

— S —

(Continued)

No. Page

Noiseless riveting machine..... 80 145
"Mars" foundry-type friction saw, 52-inch. 81 145
Single-spindle full-automatic screw machine 83 145

Smith & Coventry, Ltd.,
Manchester, England
"Pearn" tube-expanding tool...100 148

Soag Machine Tools, Ltd.,
Horseferry Road, London, S.W., England
Surface grinding machine..... 31 136
Aeroplane engine cylinder grinding machine 36 137
Fly-press type shears 71 144

Stanley Machine Tool Co., Ltd.,
Halifax, England
Chucking lathe, 32-inch swing... 44 139

Summerskill Bros.,
Sowerby Bridge, England
Open-side planing machine 64 142

Swift & Sons, Ltd., G.,
Halifax, England
Motor-driven radial girder drilling machine 10 133

— T —

Taylor & Challen, Ltd.,
Birmingham, England
High-speed notching press 67 143

— U —

Udal, J. P.
Upper Dean St., Birmingham, England
Pull-out guard on double-action press 69 143

United Machine Tool Co., Ltd.,
Gray's Inn Road, London, W.C., England
"Orbel" two-spindle horizontal drilling and tapping machine. 12 133

— V —

Viozone, Ltd.,
19, Cursitor St., London, E.C., England
Pyrometer 115 150

— W —

Waldrich, H. A.,
Siegen, Germany
Center-type roughing lathe, 5-foot 43 139

Ward & Co., Ltd., H. W.,
Birmingham, England
Honing machine for scrapers... 39 137

Watson & Sons, Ltd., W.,
313 High Holborn, London, W.C., England
Universal metallurgical microscope 113 150

Whitaker & Clapham,
Keighley, England
Five-head shaping machine..... 66 143

Wickman, Ltd., A. C.
Coventry, England
Universal hexagon turret lathe.. 49 139
Semi-automatic multi-tool lathe. 51 139
Six-spindle, full-automatic screw machine 82 145

— Z —

Zehnder & Sons, J.,
Granichen, Switzerland
Rotary filing machine..... 76 145

NEWS
OF THE WEEK · IN BRIEF

Business Items

The International Harvester Co., will immediately enlarge its Farwall tractor plant at Rock Island, Ill., by construction of a general manufacturing building, 620x230 ft. with a second story section, 90x620 ft., and the addition of two more floors to the newly-finished motor manufacturing building there, adding 93,000 sq.ft. of floor space to that factory, E. H. Sohner, superintendent, has announced. The two new activities will result in addition of about 1,000 men to the present force of 2,500 and an expenditure of $1,000,000.

The L. G. Henes Machinery Co., machine tool and equipment dealer, Los Angeles, has recently moved into a new building located at 1500 Santa Fe Ave. Frank M. Morgan is manager of the concern. The company also maintains an office in San Francisco at 75 Freemont Street.

The Union Chain & Manufacturing Company, through a recent merger with the American High Speed Chain Company, formerly of Indianapolis, is offering a line of power transmission elevating and conveying chains.

The Standard Malleable Iron Co., Muskegon, Mich., has formed a new division known as the Self Lock Nut Co., for the manufacture of a special patented lock nut.

The National Acme Co., Cleveland, maker of automatic machines and machine tools, has appointed the F. F. Barber Machinery Co., Toronto, Ontario, to act as Canadian agent.

The E. Ingraham Co., Bristol, Conn., is erecting a two-story addition 54x80 ft. The company manufactures clocks and similar articles.

The Service Tool, Die & Manufacturing Co., 2256 W. Walnut Street, Chicago, is building a plant at 4627 West Fulton Street, to contain 15,000 sq.ft.

The Hess-Bright Co., Philadelphia, Pa., ball-bearing manufacturer, is planning on building a 2-story addition in the near future.

The Carlson Forging Co., Chicago, has started building a plant to cost $75,000 at 1052-60 North Kolmar Avenue.

The Illinois Bell Telephone Company, Chicago, has approved an expenditure of $3,946,178 for a new plant in that city.

The Reynolds Metal Co., Louisville, Ky., has completed plans for an addition to cost about $60,000.

THIS WEEK

Simultaneous vacations of two weeks with full pay for workmen is proclaimed this week for 24,000 employees of the Hawthorne works of the Western Electric Co., the second largest industrial plant in the country. The remaining 14,000 employees will take their vacations two weeks hence, leaving a skeleton organization in the plant during the month.

Railway carloadings of machinery are expected to increase about 7 per cent this year, over those of last year, of automobiles, 10 per cent, and of agricultural machinery about 6 per cent.

Thirty per cent of employees in the automobile industry are now working a five-day week, while in 1925 only 1.5 per cent worked on that basis, according to a report of the Department of Labor.

A Zinc Research Corporation, to be modeled after the Copper and Brass Research Association, is soon to be organized. Ralph M. Roosevelt, president of the American Zinc Institute, made the announcement.

According to the U. S. Department of Commerce, the Netherlands East Indies is a growing market for American machinery, as a result of the expansion of the sugar, rubber, petroleum, tin, and other industries.

The newly-organized American Standards Association and the U. S. Bureau of Standards ratified a co-operative agreement to encourage national standardization.

Personals

R. C. Brower has been appointed assistant secretary-treasurer of the Timken Roller Bearing Co., Canton, Ohio. He was formerly general manager. W. H. Richardson, formerly New York branch manager, has been appointed to succeed Mr. Brower as general manager. E. H. Austin, formerly Kansas City branch manager, becomes New York City branch manager, and L. J. Haldeman, Atlanta (Ga.) branch manager, succeeds Mr. Austin. Parker T. Ancarrow, Richmond (Va.) branch manager, becomes Atlanta branch manager, and Stewart B. Ancarrow succeeds him as Richmond branch manager for the company.

George F. Bain has been made manager of the newly-established northeastern district of the Copperweld Steel Co., Glassport, Pa., with headquarters at 30 Church St., New York City. The district will include all of the New England states, and New York State north of Westchester and Rockland counties. Paul Van Wagner is now district manager for greater New York, New Jersey, Pennsylvania, and West Virginia, with offices at 30 Church St., New York.

John H. Collier, general manager of the Bridgeport, Conn., plant of the Crane Co. for the past 12 years, has been appointed assistant to president R. T. Crane, Jr., and will leave on August 1 to take up his quarters in the company's European offices, London. A successor to Mr. Collier has not been announced.

William Woosman, associated with B. F. Perkins & Co., Holyoke, Mass., machine builder, is one of four textile manufacturing experts sailing for Russia at the invitation of the Soviet government, which is planning the introduction of American methods in the Russian textile industry.

Rollin J. Schenk has been appointed Chicago district manager of the Hartford Steel Ball Co., Hartford, Conn. His offices will be in Room 900, 180 West Washington St., Chicago. The Chicago district includes Illinois, Indiana, Iowa, Michigan, Minnesota, Missouri, and Wisconsin.

E. J. Frost, founder of the Frost Gear & Forge Co., Jackson, Mich., was granted the honorary degree of mechanical engineer by Michigan State College at the annual commencement exercises held recently.

Charles Bond, president of the Charles Bond Co., sailed recently with his family for a tour of the Continent and Great Britain.

Obituaries

Charles M. Stone, one of the founders of Crandall, Stone & Co., formerly the largest manufacturer of carriage hardware in the United States and now a division of the Brewer, Titchner Corporation, maker of automobile supplies, died at his home in Binghamton, N. Y., on July 2, of heart disease. He was 73 years of age. Mr. Stone was interested in a number of civic and financial enterprises in addition to his work in the hardware and automobile supply business.

Arthur Frisbee Hemler, 40, former treasurer of the Demster Manufacturing Company, builders of steel tanks and windmills, Beatrice, Neb., died in Pasadena, Cal., on June 26.

Joseph Hammele, director and sales manager of the Bausch & Lomb Optical Co., Rochester, N. Y., died on July 2. He had been with the company 47 years.

BUSINESS BAROMETER

Industry continues at a high level and prosperity is not likely to be disturbed by the few adverse factors existent

By THEODORE H. PRICE
Editor, Commerce and Finance, New York

IN A recently published interview, Henry Ford is credited or debited with a statement in which he declared himself as in favor of a single power trust which should embrace the power plants and resources of the nation, and later on of the world. He asserted that the result would be the universal use of power and a progressive reduction in its cost.

As thus stated, the idea may seem chimerical to the reactionaries, but it expresses a generalization by which millions of Americans and Europeans are coming to be obsessed, and popular faith in it is growing strong enough to remove some of the mountains which seem to stand in the way of its realization. This popular faith may explain the abandonment of the cycle theory that was so generally accepted until recently.

Many books were written to prove that there was a periodicity in the rise and fall of business, and some economists believed that this periodicity could be scheduled with reasonable accuracy. But of late little or nothing has been heard of the "vicious circle," and the generation of younger business men who are now directing the world's affairs seem disposed to assume that combinations and consolidations through which production can be controlled and cheapened will continue indefinitely, and that the result will be a constant increase in consumption.

Upon this theory the stock market was almost buoyant last week, and an advance to 9 per cent in the rate for call money was disregarded by speculators whose faith in higher prices appears to be unshakable.

Many agree with Henry Ford that "history is bunk," and a stubborn faith in the continued prosperity and speculative enterprise of the country makes nearly everyone superconfident of the future. This leaves but little for the conscientious historian of current developments to comment upon, and among the facts that thrust themselves upon public attention last week there are but few that seem to have any important significance at present.

One is the news from Washington with regard to the tariff bill. A long debate over it seems inevitable unless President Hoover is able to make Congress do his pleasure with unprecedented promptitude. A feature of the bill which promises to lead to much discussion is the sugar duty. The impression seems to be that the sliding scale plan will be adopted, and that its adoption will be to Cuba's advantage. Hence, sugar futures in New York are somewhat higher than they have been.

From this page the reader will get a quick picture of current business and industry. The boxed material below is a summary of the letters from regional correspondents of the American Machinist sent in this week from industrial centers.

UNUSUAL business for the summer months continues in the machinery and machine tool industry. The number of individual orders for small tools and parts is maintaining sales volume.

NEW YORK prospects are unusually good, with inquiries and orders coming in thus far at a rate which presages perhaps a record season. The Chicago market is recovering from the early July recession, the Santa Fe Railroad being the largest buyer at the present time. There is a recession in purchases of heavy-duty equipment, but conditions on the whole are satisfactory. Detroit reports little activity in the machine market, the automobile manufacturers seeming inclined to hold off until fall for the placing of orders. Sales in Cleveland are holding up well, although inquiries have fallen off slightly. In Buffalo, inquiries are good, but orders have dropped off somewhat.

MILWAUKEE business is still at its high level, a number of inquiries coming from aircraft factories, and stamp- and die-plant orders bolstering sales. In Cincinnati, sales are maintaining a good level, despite the seasonal lull, with orders and inquiries coming mainly from miscellaneous small users for single tools and replacements. The New England market exhibits little change. Inquiries are fewer and orders are being held off because of slow delivery promises. The Boston & Albany Railroad will spend $500,000 in its West Springfield, Mass., shops. The Philadelphia market is maintaining a fair volume, with several large orders reported by Westinghouse.

Wheat, corn, rye and oats have all been firm, and it has been easy to bid up prices on the Chicago Board of Trade. The world's crop and prospective surplus seem to have been overestimated some weeks ago, and the market is adjusting itself to the probability of a smaller supply.

The drygoods trade in the United States is said to be a little slacker than it was, but the accuracy of this statement is doubtful, and the mills in both this country and Europe are pretty well employed, although some of them are shutting down for the usual mid-summer holidays.

The steel industry continues at capacity; the automobile manufacturers are also remarkably busy for this season of the year. The published reports would indicate that there is less new construction in progress than at this time in 1928, although it looks as if the whole of New York City was being rebuilt. But much of the work that is in progress will be paid for out of the municipal treasury, and it is probable that this is also true of public improvements that are being made in many other cities.

Financially, the situation is not much changed. Reports that the Federal Reserve banks are buying government securities have encouraged some to believe that easier money is in prospect, but the banks' statements reveal no change in the policies of the system. The astute Mr. Montagu Norman, of the Bank of England, has been visiting New York, and a cessation of gold imports, with a rise in sterling, is associated with his presence here. But the imports and exports of gold have ceased to have much significance, and little attention is paid to them.

Taken as a whole, the crop outlook in the United States seems satisfactory. The yield of most agricultural staples promises to be adequate, and if present prices can be realized for the crops that will soon be harvested, our prosperity should not be disturbed by the few adverse factors that are visible. But as previously remarked, it is the invisible for which we must be on the lookout, and the text which advises us to "Beware when all men speak well of you," would seem to be a good one for business men to keep in mind at present.

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